United States Department of the Interior
Bureau of Land Management
Elko Field Office

May 5, 2000

ENVIRONMENTAL ASSESSMENT
BLM/EK/PL-98-026

Vegetation Treatment by Fire

Serial No. N-9214

FINDING OF NO SIGNIFICANT IMPACT
AND
DECISION RECORD
Vegetation Treatment by Fire
BLM/EK/PL-98-026

Finding of No Significant Impact

Based on the analysis of Environmental Assessment BLM/EK/PL-98-026, I have determined that the proposed action will not have a significant effect on the human environment, and therefore, an environmental impact statement will not be prepared. Adherence to the Operational Procedures/Project Design outlined in the Environmental Assessment will serve to avoid or minimize potential harm to the affected environment.

Decision

It is my decision to authorize vegetation treatment by fire as described in the proposed action of BLM/EK/PL-98-026.

Rationale

The proposed action will enable fire to be re-introduced into fire dependent ecosystems as an important ecological process. The action will contribute to maintaining and improving plant and wildlife species diversity within fire dependent ecosystems and break up vegetative fuel continuity to reduce future wildfire size and severity. It will also afford protection to natural and cultural/social resources from severe fire.

The No Action alternative was not selected because it would not allow for fire to be used as an important ecological process to improve and maintain fire dependent ecosystems and reduce the threats from future severe wildfires.

The proposed action and alternatives described below are in conformance with the Elko Resource Management Plan, Issue 6, management prescription 2, and the Wells Resource Management Plan, Issues 6 and 8, management prescriptions 3 and 6, and are consistent with Federal, State, and local laws, regulations, and plans to the maximum extent possible.

_____________________________ _______________________
Field Office Manager Date

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I. Introduction/Purpose and Need

A. Introduction

The intent of this Environmental Assessment (EA) is to analyze the impacts associated with vegetation treatment by fire on lands managed by the Elko Field Office of the Bureau of Land Management (BLM). The Elko Field Office encompasses approximately 7.5 million acres of public land in Northeastern Nevada (Map 1). Fire is an integral and important naturally occurring ecological process within many of the Great Basin's vegetation communities. Wildland fire and prescribed burns can be used as significant vegetation management tools, modifying vegetation composition and age-class structure, and mimicking natural disturbance processes.

Areas to be excluded from proposed vegetation treatments include those with widespread annual grass invasion, desert shrub and white sage communities that do not have fire as a natural part of the ecosystem, and areas dominated by a high component of noxious weeds.

B. Purpose and Need

The purpose of prescribed fire is provide a cost-effective and ecologically sound management tool for the BLM. Fire suppression in the Great Basin has led to the increase of the abundance of shrubs and reduced the herbaceous vegetation regardless of management (West 1978, Sneva et. al. 1984). Fire can be used to reduce canopy cover, change the age structure of woody vegetation communities, increase production of native perennial grasses and forbs, and increase forage and biological diversity. Fire can also be used to break up vegetative fuel continuity, reduce future fire severity, and reduce the negative effects of wildfire. This affords protection to natural and cultural/social resources from severe fire. Fire can also be used as a tool for maintaining existing seeding projects.

The Elko District Resource Management Plans (RMPs) for both the Elko and Wells Resource Areas have identified a need for prescribed fire as a management tool to enhance resource values.

C. Scoping and Issues Identified

Issues identified through internal scoping within BLM include:

1. Air Quality concerns over the Class 1 airshed of the Jarbidge Wilderness and sensitive receptors to smoke.

2. Cultural sites that still need to be identified and protected prior to conducting a prescribed burn on a site.

3. Invasion of noxious weeds from areas adjacent to burns and propagation of existing weed species within the burn.

4. Proper post-fire grazing management practices to insure vegetative re-establishment.

5. Loss of aspen stands due to encroachment by sagebrush and mixed conifer.

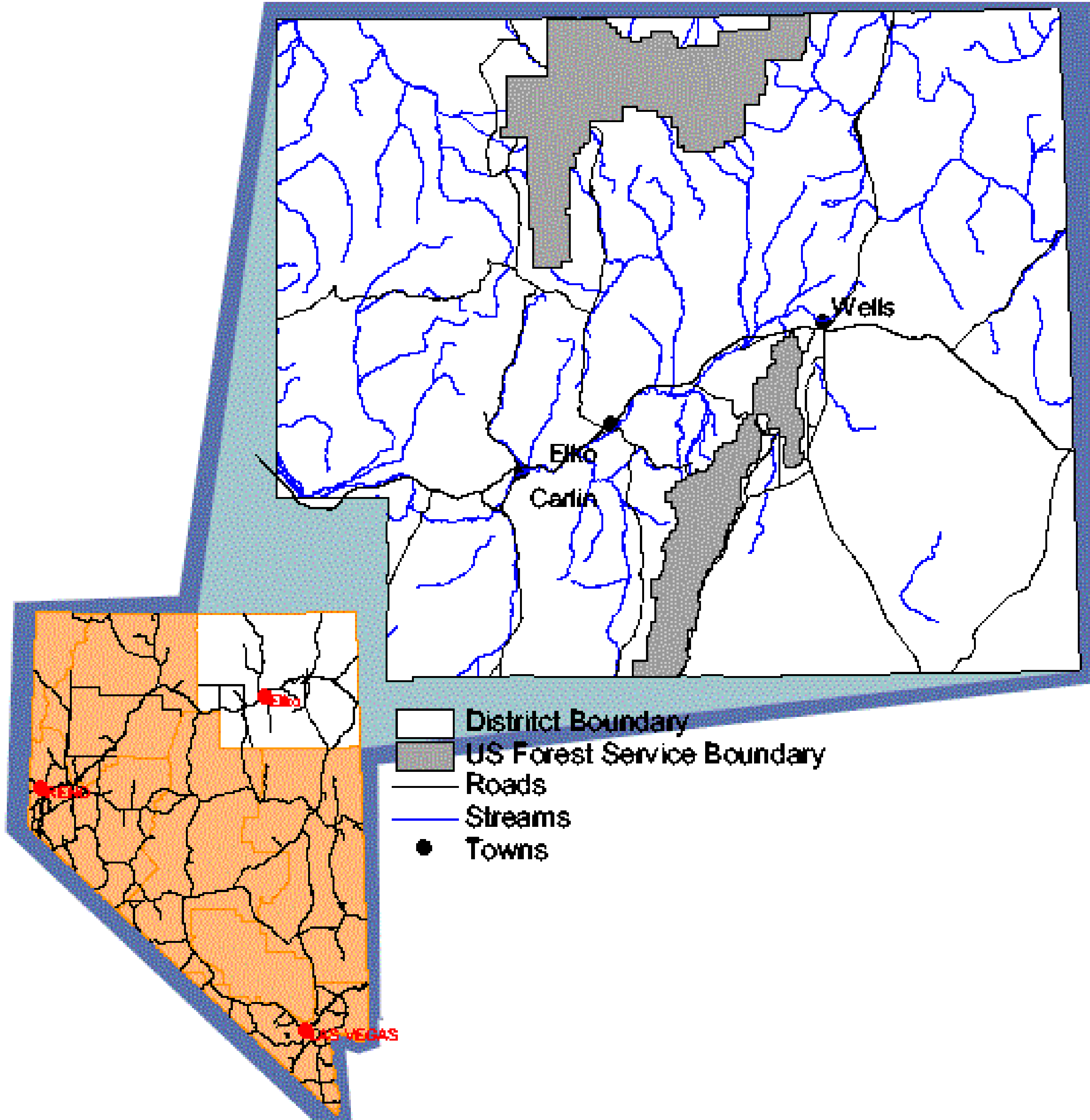
As part of the public scoping process the Elko Field Office mailed interest questionnaires to 574 individuals, agencies, and groups on the Field Office mailing list on August 13, 1998. The Field Office also put out a news release on August 17 requesting comments. There were 61 responses. Of these 61 responses there were eleven (11) that contained comments. Comments received during the scoping period have been considered in this analysis and are presented below with a reference to the section in which the comment has been addressed.

Issues	*Commentator*
- Potential positive effects of fire on rangeland communities. (pgs. III-15-23/IV-12-16)	Ray C. Bedke Peter M. Mori Cal Lewis Tom Miller Von L. Sorensen James D. Morefield
- Potential for cooperative public and private projects on adjacent lands. (pg. II-5/IV-4)	Jon Griggs Joe Marvel
- Post fire grazing management. (pg. II-4)	George Loa Committee for Idaho's High Desert
- Invasion of burned areas by annual grasses and noxious weeds. (Pg. I-1/II-4/III-22/IV-14)	Committee for Idaho's High Desert James D. Morefield
- Visual impacts (pg. III-9/IV-8)	Committee for Idaho's High Desert
- Cryptogamic crust/soils (pg. III-12/IV-10)	Committee for Idaho's High Desert

- Threatened and Endangered Species (pg. III-11/IV-10)	Committee for Idaho's High Desert
- Air pollution (pg. III-1/IV-1)	Craig C. Downer
- Post- fire seeding mixes (Beyond scope of this document)	James D. Morefield

D. Land Use Plan Conformance Statement

The proposed action and alternatives described below are in conformance with the Elko Resource Management Plan, Issue 6, management prescription 2, and the Wells Resource Management Plan, Issues 6 and 8, management decisions 3 and 6, and are consistent with Federal, State, and local laws, regulations, and plans to the maximum extent possible.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II. Proposed Action and Alternatives

A. Proposed Action

The Elko Field Office of BLM proposes to conduct prescribed fires and manage some naturally occurring wildland fires to achieve resource benefits on public lands throughout the Elko District. Prescribed fires would be used as a resource management tool to increase plant species diversity, improve wildlife habitat, increase livestock forage production, reduce fuel loading and decrease the occurrence of large severe wildland fires, improve forage production on seeded and chained areas, and protect the urban interface and other cultural resources. The use of prescribed fires as a resource management tool would be used as directed in the current RMP's for the Elko District. The proposed prescribed burn acreage would vary by year dependent on project planning, funding and staffing levels. BLM is proposing to conduct prescribed fire on up to 2000 acres in the year 2000. It is estimated that up to 5,000 acres per year could be proposed to be burned for the years 2001 to 2005. Future projects would depend upon identified need and funding. Some naturally occurring lightning fires would be allowed to burn within designated areas. Ignitions, both management and natural, would only occur or be managed within prescription parameters set within individual burn plans.

Prescribed fires would be utilized to manage seven different vegetation types. These vegetation types are:

1. Sagebrush - perennial grasses
2. Pinyon - Juniper
3. Aspen
4. Mixed Conifer
5. Small areas of mountain brush (i.e. bitterbrush, serviceberry, etc.)
6. Crested wheatgrass seedings
7. Riparian areas

Prescribed fires could be conducted during the period from spring to winter for all of the aforementioned vegetation types, except for the mixed conifer. Prescribed fires would only be conducted in the mixed conifer stands during mid-July to mid-September when these fuels are dry enough to burn.

The design and planning processes of a prescribed burn would begin with a survey of the proposed prescribed fire site. If the desired management objectives can be met by prescribed fire, the project area boundaries and the individual burn units would be mapped. The appropriate NEPA documentation and the Prescribed Burn Plan (See Appendix A for Prescribed Burn Plan Critical Elements) would be developed for the specific site. After adequate technical review and line officer approval, the Burn Plan would be submitted to the

State of Nevada Bureau of Air Quality for approval and the issuance of a burn permit. The burn would be conducted dependent on weather conditions and availability of resources. Managed naturally occurring ignitions in wildland fire use areas would require a plan completed for the specific area prior to allowing the ignitions to burn.

Operational Procedures/Project Design:

1- Standard operating procedures required prior to the implementation of the burn plan include a survey for Threatened, Endangered, and sensitive plant and animal species and inventories at the appropriate level for cultural and paleontological resources. If the inventories show presence of heat sensitive, significant cultural or paleontological resources, Native American traditional cultural properties or sacred areas, or Threatened, Endangered, or sensitive species, the burn plan would be modified to exclude these sensitive features or appropriate protection measures would be added to protect them.

2- Use of constructed firelines would be minimized through careful timing of ignition and utilization of natural fuel breaks and existing roads to minimize ground disturbance. Constructed firelines, if needed, could be utilized in any of the vegetation types. Control lines could consist of, but would not be limited to, constructed hand lines and dozer lines, laying of foam lines, and changes in fuel types and distribution. Hand lines and dozer lines would be utilized only when necessary and on a limited basis. Existing roads would be graded when necessary to remove the build-up of vegetation or fuels from the center of the road.

3- The ignition sources described below could be utilized in any or all of the vegetation types. For each prescribed fire a single type or a combination of ignition sources could be used. Ignition sources could consist of hand techniques, mechanical techniques, and natural ignitions. Hand ignition techniques include drip torches, fuzees, and flares. Mechanical ignition techniques include the terra torch and aerial ignition using plastic sphere dispensers or heli-torches. Materials used in these ignition devices include potassium permanganate and ethyl glycol (antifreeze) in plastic sphere dispensers, gasoline and alumagel in terra torches and heli-torches, gasoline and diesel in drip torches, and various sulphur and phosphorus compounds in fuzees and flares. All appropriate Material Safety Data Sheets and Occupational Health and Safety Administration (OSHA) regulations would be followed for storage, transport, use and disposal. Natural ignition would occur by lightning strike.

4- After the completion of a burn, any constructed firelines would be rehabilitated to minimize disturbance, erosion, or visual impairment. Berms created during fireline construction would be leveled off, vegetative debris would be spread over the constructed line, and water bars would be constructed if needed.

5- All equipment and man-made debris would be removed from the site and disposed of in an approved facility in accordance with all applicable federal, state, and local laws.

6- Air quality issues would be managed according to the following principal strategies of managing smoke from prescribed fires:

> *Avoidance* - Considers meteorological conditions when scheduling burn projects to avoid incursion of smoke into smoke sensitive areas. This includes burning outside of the primary burning season to reduce combined effects on air resources; burning when wind is blowing away from smoke sensitive areas, and avoiding heavy public use periods.
> *Dilution* - Includes burning when weather systems are unstable; venting smoke columns into a fog layer or low clouds; rotating burning among airsheds; avoiding days with low morning transport wind speeds.
> *Emission Reduction* - Utilizes techniques to minimize the smoke output per area treated. Includes reducing burned acreage; reducing pre-burn fuel loadings; reducing fuel consumption; lowering emission factors by using higher fire intensity and piles; and using firing techniques to produce the least emissions.

Smoke emission modeling would be used to determine effects on sensitive receptors. This includes Class 1 airsheds, inhabited structures/ranches and major roads within 10 miles of the project site. If modeling shows an exceedance of air quality standards, the burn plan would be modified to reduce emissions Prior to any burning, residents close to the project site would be notified to see if there are any smoke-related concerns. If a resident has health- related issues, the project would be modified to address those concerns. This could include offering temporary relocation to sensitive individuals in order to avoid smoke. Traffic control measures as well as road signing would also be utilized if there would be potential visibility issues on public roadways. Prescribed fires exceeding air quality parameters would have appropriate action taken to reduce smoke emissions.

The Nevada State Implementation Plan (SIP) for Air Quality and appropriate Environmental Protection Agency guidelines for prescribed fire would be followed.

7- The level of cultural resource inventory completed for any prescribed fire would be commensurate with the anticipated effect. At a minimum, a reconnaissance inventory would be conducted to confirm that the nature of the archaeological/historical remains in the project area conform to the expectations derived from a file search. Bladed firelines (including previously un-bladed two-track roads), hand lines, areas subject to repeated vehicle use, staging areas and any other locations where earth disturbance is anticipated would be inventoried at a class III level (100% inventory). A class III inventory of the burn areas would be conducted if: 1) it is anticipated that sites containing combustible artifacts, features or structures are present; 2) the prescribed fire is planned for forested areas; and 3) the fire is predicted to burn hotter than 350° C within the surface or duff layers that may have cultural resources.

Inventory beyond reconnaissance would not ordinarily be conducted if: 1) the fire were to be contained within the boundaries of an old crested wheat seeding or a chaining; 2) the fire is predicted to burn cooler than 350° C and no sites with combustible materials or materials vulnerable to damage at temperatures below 350° C are anticipated to be present; 3) the area is known to have burned at temperatures above 350° C within the last 30 years.

Should the nature of the cultural resources in an area be in question or if the burn is in an area of mixed cultural resource sensitivity, a partial inventory would be conducted. Cultural properties vulnerable to fire would be protected by exclusion from the burn area or by appropriate fire suppression protection measures. Fireline construction would avoid significant cultural properties. Sites found during the operational aspects of the prescribed fire would be avoided/protected by modifying the holding operations or firing patterns.

8- Surface disturbance from fireline construction would be minimized within 500 feet of riparian/wetland areas and avoided whenever possible. Unburned strips of vegetation would generally be left along those areas with flowing water courses areas to serve as slope stability buffers, and to decrease the potential for stream sedimentation. The width of buffer strips would vary, dependent on site specific conditions. Prescribed burns in riparian/wetland areas would generally occur in spring or at times when duff and organic soil moisture contents were 100 percent or greater. Use of fire retardant chemicals or wetting agents in or near waterways would be avoided.

9- Any area having natural ignitions (wildland fire use) as part of the fire management plan would have individual area specific fire prescriptions written prior to allowing natural ignitions to burn. These areas include Wilderness Study Areas (WSA's), mixed conifer areas, and areas in the Owyhee Desert described in the 1998 Elko Field Office Fire Management Plan.

10- No prescribed fire activity would be planned for areas used as municipal watersheds. No burn plans for natural ignitions would be considered in municipal watersheds.

11- The existing and ongoing noxious weed inventory for the Field Office would be used to determine if there is a noxious weed presence in the burn area. Significant weed populations would be avoided to prevent the spread of these plants, unless further environmental analyses shows no threat. If there is a high probability of undesirable native increaser species colonizing the burn area after the fire, prescribed fire will not be used.

12- Post-fire grazing management plans would be used to insure the reestablishment of native or desired vegetation. Each prescribed fire project would have a site-specific post fire grazing plan which could include temporary fencing, changing the seasonality of use or temporary suspension of use.

13- In areas of mixed ownership, adjacent private land owners would be consulted prior to planning a burn on public lands. Agreements can be developed with private landowners to conduct joint prescribed fire projects. Cost share agreements based on acreage burned would be developed along with a statement of common objectives for the proposed treatment.

14- Prescribed fire activities would be avoided in wild horse foaling areas during peak foaling times from March 1 through June 30.

15- Known sage grouse lekking and brood areas would be avoided during March through June. Known sage grouse wintering areas would be avoided from November through March. In areas where there is a close proximity to known lekking, brood, and wintering grounds, further evaluation would be conducted prior to any action.

16- All proposed fire actions in WSA's would be identified and analyzed individually. In planning fire lines, natural fuel breaks, cherry-stem and boundary roads would be relied upon. The use of constructed fire line would be discouraged. "Light-Hand on the Land" fire suppression methods would be used.

17- In mixed conifer wildland fire use areas outside of WSA's, appropriate suppression tactics would be used to protect high value resources (natural and cultural) and to prevent fire from exceeding predesignated boundaries. These areas include the Cherry Creek, Dolly Varden, Pequop, and Spruce Mountains.

18. Areas in the urban interface identified for fuels reduction by prescribed fire would be analyzed separately and in conjunction with the Nevada Division of Forestry and affected landowners. This analysis would include a complete risk analysis of possible impacts on the private lands and inhabitants within the project area.

19. Prescribed fire would be utilized in riparian areas only if the areas have a high response potential for improved habitat conditions as a result of the prescribed burning.

B. Alternatives to the Proposed Action

1. No Action Alternative

Under this alternative, prescribed fire would not be used as a management tool for vegetation treatment on the Elko District. There would be no opportunity to use prescribed fire for habitat management, fuel hazard reduction, or to improve vegetative community diversity. Other tools such as chemical and mechanical devices could be used as a resource management tool if authorized to meet management objectives as described in the Elko District Resource Management Plan.

2. Other Alternatives Considered but Eliminated from Detailed Analysis

a. Only Treat Seeding and Chaining Sites. Use prescribed fire to maintain and enhance previously modified sites such as seeding and chaining sites. This alternative fails to meet the underlying need to use fire as an appropriate management tool in fire-adapted vegetative communities on the District.

b. Full Suppression. Use full suppression tactics on every wildland fire regardless of cost or resource benefit. Use only management ignited fires to accomplish resource management goals. This alternative fails to meet current Department of the Interior policy on reintroduction of fire where appropriate, and would eliminate the use of natural ignition as an appropriate management tool.

c. Natural Ignition Only. Use natural ignitions only in designated areas to accomplish prescribed fire objectives. This alternative would affect approximately 18 percent of the District and would not achieve the overall goals of vegetation management by fire on a District-wide basis. It would also constrain burning to the July-August time period when most lightning occurs.

III. Affected Environment

A. Proposed Action

The Elko District consists of approximately 7.5 million acres in northeastern Nevada. The vegetation types range from desert shrub to mixed conifer. Many of the vegetation communities evolved under a regime of intermittent fire and are adapted in some way to fire. The historic (natural) fire regimes ranged from non-lethal surface fires to large lethal fires. The present fire regimes are different from the historical regimes due to fuel and successional changes caused by post-settlement activities, biotic succession caused by fire exclusion, invasion of exotic species, extinction of species and ecotypes, fragmented biotic communities, and possible long term climatic change.

The following critical elements of the human environment are not present or are not affected by the proposed action or alternatives in this EA:

Areas of Critical Environmental Concern (ACEC)
Environmental Justice
Farm Lands (prime or unique)
Floodplains
Paleontology
Wastes (hazardous or solid)

Bureau specialists have further determined that the following resources, although present in the project area, are not affected by the proposed action:

Geology/Minerals

Resources Present and Brought Forward for Analysis:

1. Air Quality- Air quality within the interior west was not pristine prior to European settlement in the late 1800's, especially in regards to smoke. Many historical accounts refer to the presence of smoke and burned areas within the Great Basin. Levels of smoke declined as fire was excluded from the land, particularly after the initiation of organized fire suppression.

National Ambient Air Quality Standards (NAAQS) have been established for six criteria pollutants: sulfur dioxide (SO2), particulate matter (PM10), carbon monoxide (CO), ozone (O3), nitrogen oxides (NOx) and lead (Pb). Nitrogen and sulfur oxides can cause adverse effects on visibility, plant life and water quality. The majority of these pollutants are primarily associated with urbanization and industrialization rather than the natural resource management activity of prescribed fire and are not dealt with further in this analysis.

The criteria pollutants of primary concern with wildland fire are ozone, particulate matter (PM10 and PM2.5) and carbon monoxide (CO). CO is a localized "fireline" pollutant with little impact on air resources away from the burn site because of its rapid dilution in the atmosphere. Ozone is a photochemical pollutant formed on sunny days from the chemical reaction of nitrogen dioxide and hydrocarbon emissions. Ozone chemistry is poorly understood, but it is known to be present in the smoke plumes downwind of large fires. Organic emissions from vegetation are also known to capture ozone, so the rangelands and forest lands are both a source and sink for ozone. Because of generally favorable plume height, as well as the infrequency and short duration of prescribed burns, there normally is not a significant human or ecological health concern. The PM10 and PM2.5 do not seriously affect rangeland and forest vegetation types, but can impact the human respiratory system. Since wildland fire historically was a natural occurrence within the range and forest vegetation types described, these ecosystems have some natural adaptation to the effects of fire.

The Clean Air Act requires the State of Nevada to develop, adopt and implement a State Implementation Plan (SIP) to assure that NAAQS are attained and maintained for criteria pollutants. The general conformity provisions of the Clean Air Act (Section 176(c)) prohibit Federal agencies from taking any action within a non-attainment area that causes or contributes to a new violation of the NAAQS's, increases the frequency or severity of an existing violation, or delays the timely attainment of a standard. The Environmental Protection Agency has developed and finalized criteria (and has a new proposed prescribed fire criteria) and procedures for demonstrating and ensuring the conformity of Federal actions to the SIP. As it is written, they apply only to Federal actions within non-attainment areas. There are no non-attainment areas within the Elko District. Therefore the conformity regulations do not apply to the management actions proposed in this document. Federal actions still must comply with the current SIP. The State of Nevada is currently revising its SIP and it will incorporate prescribed fire smoke management provisions.

Areas are classified either as having attainment or nonattainment status or they are unclassified for meeting air quality standards. Unclassified areas are generally treated as attainment areas. The airsheds in Nevada are only classified according to federal standards.

All of the BLM administered lands and private lands within the Elko District are classified as PSD (Prevention of Significant Deterioration of Air Quality -Sections 160-169) Class II. The Jarbidge Wilderness Area in northern Elko County is classified as a PSD Class 1 with little or no degradation allowed.

Wildland fires can impact the air resource by degrading ambient air quality and impairing visibility. The wildland fire regime is currently much different than it was historically, because of increased fuel loadings, development of ladder fuels, and increases in stand density. The forest vegetation has changed from being primarily a non-lethal or mixed fire regime to lethal (stand replacement) fires (Quigley and Haynes, 1996). The rangeland fuels have also changed with increased fuel loadings of shrubs and invasion of woody species into grass/shrublands. Brown and Bradshaw (1996) found that emissions from modern fires have increased because fuel consumption (fuel per unit area burned) rates have increased. One of the goals of prescribed fire is to reduce the amount of fuel present and reduce the potential for future lethal fires. Using prescribed fire in sagebrush/ grass vegetation communities could have a similar effect by increasing the percentage of grasses and reducing the heavier sagebrush fuels. While prescribed fire can result in temporary negative impacts on air quality, acute impacts to air quality from wildfire can be reduced in the long term (Schaaf, 1996). Ottmar et al (1996) estimate that the amount of PM10 emissions from prescribed fire in shrub communities is approximately 71 percent of the emissions from wildfire within the same vegetation type. In forest communities the estimate is 74 percent (ibid).

2. Native American Consultation/Religious Concerns -- Traditionally the Shoshone have had close ties with the land. The earth is believed to be imbued with supernatural power and a major religious goal is the acquisition and use of power (Rusco and Raven, 1992). Not only the earth, but all animals, plants and inanimate objects are believed to contain varying degrees of power. This is why traditional Shoshone pray or give an offering when gathering natural resources and why many view virtually any invasive use of the public domain as being detrimental to their belief system and traditions.

While all objects potentially possess power, concentrations of power are found in certain areas and have special significance to the Shoshone people. Such locations may be used for healing, praying or ceremonies. Other locations, such as those where medicinal plants, basket weaving materials, or food resources are gathered may also be crucial to maintaining Shoshone traditions.

The Elko District encompasses an area that lies within the traditional territory of the Western Shoshone. Eight Native American tribes, bands or organizations were consulted/notified by the BLM regarding the proposed prescribed fire plan. The responses were varied but no locations were identified that would qualify for listing on the National Register of Historic places as traditional cultural properties nor were any areas identified as having significant traditional or religious values as defined by other Federal legislation, executive order or regulation. However, several areas of known or suspected traditional/spiritual significance are identified in the ethnographic literature.

Information pertaining to the location and significance of traditional cultural properties and sacred areas is usually considered confidential and not shared with outsiders. Consequently only limited information is available for analysis. Of the known locations, two appear to be the most significant. One is along the Willow Creek drainage and the other is at Rock

Creek. The Willow Creek drainage including the Midas, Tuscarora and Ivanhoe areas has been identified by the Shoshone as a source of power (Rusco and Raven 1992). Within the larger Willow Creek area, three specific localities have been identified. Tosawihi Quarry is the best documented. Tosawihi is considered important because of the presence of two power spots, because it is the source of white chert that is regarded by some to convey power or to aid in doctoring, and because it is a focal point of ethnic identity for the Tosawihi Shoshone. Little is known of the other two localities. Both are power sources. One, consisting of two springs, is located in the Tuscarora Mountains. The other is a located near Midas.

A sacred location along Rock Creek continues to be used for ceremony and healing, drawing Shoshone and others from a wide area (Harney, 1995). Other locations reported to have special meaning to some Shoshone include a locality or localities in the Pequop Mountains and two former Sun Dance locations along the Humboldt River. The eligibility determinations are being made for the Rock Creek and Tosawihi sites, and are presently at the State Historic Preservation Office (SHPO) for evaluation.

In accordance with Federal legislation and executive orders, Federal agencies must consider the impacts their actions may have on Native American traditions and religious practices. Consequently, the BLM must take steps to identify locations having traditional cultural or religious values to Native Americans and insure that its actions do not unduly or unnecessarily burden the pursuit of traditional religion or traditional lifeways.

As part of its legal obligation BLM consulted with or attempted to consult with the Te-Moak Tribe of the Western Shoshone, the Battle Mountain Band of the Te-Moak Tribe, the Elko Band of the Te-Moak Tribe, the Wells Band of the Te-Moak Tribe, the South Fork Band of the Te-Moak Tribe, the Western Shoshone Historic Preservation Society, The Shoshone Paiute Tribe and the Shoshone-Bannock Tribe. An invitation to enter into consultation was initiated by the BLM to these groups on March 23, 1998. Over the next six months the BLM solicited comments and recommendations through phone calls, and two meetings between the BLM and the Te-Moak Tribe (See Appendix D)

Some tribes or bands did not respond to BLM attempts to consult, one expressed no concerns with the proposal, another requested that consultation be conducted burn by burn due to the difficulty of responding to such a huge proposal, one objected to the proposal on the grounds that all archaeological remains belong to the Western Shoshone and are not to be adversely affected in any way, and another expressed general concerns about potential damages to resources (especially pinyon groves) caused by escaped prescribed fires. The primary purpose of consulting with the Shoshone was to determine adverse effects of the prescribed fire plan. But an attempt was also made to elicit possible ways that the BLM could use prescribed burns to benefit the Shoshone. For example in other areas fire is used to stimulate or encourage growth of plants used for medicinal purposes, food or for manufacture of traditional textiles and equipment. Two elders responded that they knew of no such beneficial use of fire. One said that cheatgrass comes in after fires and the other said that she knew of no need for burning. Willows used for basket making do not need to be burned. They come from traditionally used areas that are already blessed. At other locations the willows are brittle or otherwise unusable. A chronology of Native American contacts is provided in Appendix D.

Most of the comments received, while recognized as valid concerns to the commentators, do not address the purpose of doing consultation/notification, which is to identify areas of traditional or religious significance, as defined by statute, executive order, regulation or policy, that might be effected by the proposed action. The BLM shares the commentators' concerns as to the need to protect significant archaeological resources, and as presented elsewhere in this document, measures are being taken to protect historic properties (eligible properties) identified within the project area. While some Shoshone believe that archaeological sites are sacred and that the artifacts within them belong to the Shoshone, the BLM is mandated to manage cultural resources for the benefit of all the public. The artifacts and archaeological sites, excepting those specifically identified in the Native American Graves and Repatriation Act, are public property.

3. Cultural Resources- The Elko District is rich in cultural resources. Approximately 10% of the District has been inventoried, resulting in the recording of 11,000 prehistoric and historic archaeological sites. Prehistoric use spanned the last 12,000 years. The people occupying the area were hunter-gatherers who practiced a mobile lifestyle. Camp sites were usually small and were inhabited relatively briefly. Winter usually was the only time long-term camps were established and larger groups gathered in one location. The first inhabitants of the region are thought to have arrived at the end of the Pleistocene period. Populations were very low and resource exploitation was centered on the lowlands, particularly the marshes that developed as pluvial lakes dried. As time passed, population increased and uplands as well as the lowlands were fully utilized. Population appears to have peaked in the Late Archaic Period, 700-1300 years ago. The archaeological evidence of prehistoric use range from a location where someone lost a single artifact to places where there are large collections of artifacts and archaeological features. Among the site types are: isolated artifacts, pot drops, butchering locations, toolstone quarries, rock art sites, camp sites, villages, seed processing locations, game observation posts, tool manufacturing locations, hunting blinds, and wild game traps.

Flaked stone tools are less susceptible to fire effects, but still can be altered or even destroyed by range and forest fires. Impacts include smudging, cracking, breaking, spalling, shattering and oxidizing. The intensity and duration of the heat is the most important factor. The minimum temperature needed to cause changes to flaked stone artifacts depends on the chemical and physical characteristics of the rock. Laboratory experiments indicate that some crystalline structure of silica-rich stone can be altered or the stone broken at temperatures above 370 °C (Hanes 1994: VIII-2). Others require temperatures in excess of 500 °C. Post-fire field observations in several areas, including the Elko District, confirm damage to chert artifacts from high-intensity burning. The percentage of fire-damaged flaked stone artifacts observed in the Elko District is low. Many of the observed burned sites contained no damaged artifacts. Others contain a few damaged artifacts, usually in locations where fuel was heavy and the heat high. The most damage was observed in a fire where native chert and ignimbrite (welded tuff obsidian) cobbles were buried in the duff around the base of juniper trees. Both intensity and duration of the heat were increased at these locations, accounting for greater amount of breakage of the chert. The ignimbrite appears to be more heat resistant. Only two cobbles were broken, both were against the trunks of trees where the heat would have been very high and of long duration.

Larger stone artifacts and rocks appear to be relatively unaffected by all but the most intense fires. Smudging occurs, but breakage is uncommon. One concern that has been raised is the possibility that burned native rocks would be indistinguishable from rocks used for cooking and heating by prehistoric people (Conner et al. 1989:304). Field observations in the Elko District indicate that range fires seldom fracture stones found on the ground surface. When breakage does occur it is confined to removing a spall or spalls from an exposed edge. Extensive fracturing, as found with cooking/heating stones, has not been observed. Naturally heat-spalled rocks are not usually found on flat ground, instead they are found on slopes where the intensity of the heat at the ground surface is greatly increased due to the flame edge moving up a steep angle of repose.

Pottery may be seriously affected by fire by affecting its chemical composition, changing their colors, and altering or removing their decorative paints. Substantial changes occur at temperatures of 495 °C and above (Hanes 1994: VIII-3).

Fire can also affect the ability of archaeologists to date prehistoric sites. This includes contamination of radiocarbon samples with modern ash and charcoal and physically or chemically altering datable materials. Thermoluminescence dating of pottery and rock requires measuring the minute amounts of light accumulated in the matrix of rocks and pottery due to the decay of radioactive material since the material was last heated. Exposure to high heat, such as a wildland fire, will reduce or eliminate the light and provide dates that are inaccurate. Obsidian hydration is a dating technique that measures the amount of moisture absorbed by obsidian artifacts. The moisture accumulates at a steady rate and forms a microscopic band on the surface of the artifact. By measuring the thickness of the band, the age of the artifact can be estimated. Exposure to high heat can alter or destroy the hydration band. Archeomagnetic dating measures the orientation of electrons in clay of prehistoric hearths. The electrons in unheated clay align with the north pole but are frozen in place by heating. Dates are obtained by comparing the orientation data with tables showing the location of the north pole as it has shifted over time. If hearths are exposed to temperatures exceeding 524°C the electrons will realign with the current magnetic field erasing the record of its prehistoric use (Hanes 1994: VIII-4).

Wildfire caused either by natural causes or by native peoples has been a major element in development of the ecosystems in the western United States. Before intensive fire suppression began in the mid 1900's in northeast Nevada, wildfires were common. Estimates place the interval between fires for any given area in the sagebrush vegetation communities of between 11 to 100 years and for pinyon-juniper an interval of 10-30 years with severe crown fires every 200-300 years. While these numbers are based on limited data and are not specific to this area, the point is that fire occurred often throughout the west and there is no reason to believe that they were not common in the Elko District. No studies have been made to quantify the fire history of this area nor to determine the impacts to cultural resources,

The Elko District also contains abundant evidence of our historic era heritage. The Humboldt River served as a primary corridor for the exploration and settlement of the west. Elko County was one of the first parts of Nevada explored by Euro-Americans. The first recorded penetration of the area was by the Hudson Fur Company in 1828. Traces of both the main California Emigrant Trail and the infamous Hastings Cutoff (used by the Donner Party) cross the district, as do the first transcontinental railroad, the first transcontinental telephone and the first transcontinental highway. Innumerable other historic resources are present including the remains of mining camps, railroad towns, ranches, farms, cow and sheep camps, Native American villages, wagon roads, aspen art, and horse traps.

4. Lands- The Elko District covers the area encompassed by Township 26 North to Township 31 North by Range 48 East to Range 70 East and Township 32 North to Township 47 North by Range 44 East to Range 70 East, Mount Diablo Base and Meridian (Figure 1). The Elko District consists of 7.5 million acres of public lands administered by the BLM. A forty mile wide strip along the railroad consists of a checkerboard of private and public lands.

Authorized land uses occurring on the public lands consist of powerlines, gas pipelines, oil and gas wells with associated pipelines and storage tanks, and mining operations with associated buildings and structures. Throughout the Elko District these encumbrances are located either on a mixture of both the public and private lands or they are located strictly on public or private lands. Scattered throughout the Elko District are tracts of private land which have structures.

Communities (Elko, Carlin, Battle Mountain, Wells, Wendover, Jackpot, Tuscarora, Midas, Crescent Valley, Beowawe, South Fork, Contact, Lee, Jiggs.) are located on private lands owned by various people and entities. These communities are located on private lands that are adjacent to public lands, which sometimes have small tracts of public lands intermingled with large tracts of private lands. These communities range in size from a few people or dwellings to a urban area of 25,000 people.

5. Water Resources- Average annual precipitation for this area ranges from 6 inches in the lower elevations to 30 inches in the mountains mostly from winter snows and late spring rains. Very little precipitation falls in the summer months, but thunderstorm events often result in intense, short-duration rainfall. January temperatures range from an average minimum temperature of 13° F to an average maximum temperature of 34° F. July temperatures typically average from 60° F (minimum) to 90° F (maximum). The Elko District is located within four hydrographic basins (Snake River, Humboldt River, Central Region, and Great Salt Lake) in the northeastern corner of Nevada. Runoff and infiltration vary with slope, amount of vegetative cover, and soil or rock cover. Fire, whether natural or prescribed, directly affects the vegetative cover, thus affecting runoff and infiltration. Peak runoff typically occurs during April, May, and June.

The major rivers of this area include the Humboldt flowing through the southwest portion of the District, the Owyhee and Bruneau in the northwest, and Salmon Falls Creek in the northeast. Peak flows typically occur during April, May, and June.

Water availability varies greatly in the northeastern part of Nevada. Some mountainous areas have abundant water in springs, streams, and ponds with many man-made reservoirs downstream to store the water for various uses. The landscape is characterized mostly by intermittent and ephemeral drainages. Surface water is used for irrigation, stockwater, wildlife, recreation, domestic, and municipal use as well as in-stream flows and riparian habitat. The water supply can be extremely scarce in other areas due to soil impermeability, low precipitation, and evapo-transpiration from seasonal playas. Water quality on designated rivers and streams normally meets the Nevada State standards within the Elko District. However in 1998 the Humboldt River between Osino and Battle Mountain exceeded the standards for turbidity, phosphorus and iron and is now on the EPA 303(d) list for having impaired water. Most of the streams and all of the springs within the District boundaries do not have any specific state water quality standards and the state does not test these non-classified waters.

Several municipal watersheds including Carlin, Wendover, and Montello, have been identified in the Elko District Fire Management Plan (see Chapter 1) as needing protection from fire. These watersheds include springs which provide drinking water for these communities.

6. Wild and Scenic Rivers- There is one eligible Wild and Scenic River in the Elko District. A 1992 BLM study evaluated 24.6 miles of the South Fork Owyhee River and 2.6 miles of Fourmile Creek (a tributary) for eligibility as wild, scenic, or recreational river segments under the Wild and Scenic Rivers Act of 1968 (P.L. 90-542). This study found that 23.6 miles of the South Fork Owyhee River meet the wild river criteria and 1.0 mile meets the scenic river criteria. Also, 2.2 miles of Fourmile Creek were found eligible for wild river status. The eligible river corridors extend for one-half mile on either side of the river. These river segments are within the South Fork Owyhee River and Owyhee Canyon Wilderness Study Areas. Management of this eligible Wild and Scenic River is guided by the Interim Management Policy for Lands Under Wilderness Review.

7. Wilderness- There are ten Wilderness Study Areas (WSA) in the Elko District. These WSAs were identified through an inventory process in the late 1970's. Those lands that were found to contain wilderness values were named as Wilderness Study Areas through the Resource Management Plan (RMP) and EIS processes. WSA management is guided by the 1995 edition of the BLM Manual Handbook H-8550-1, Interim Management Policy for Lands Under Wilderness Review (IMP).

Wilderness Study Areas	Acreage
Bluebell	55,665
Goshute Peak	69,770
South Pequop	41,090
Cedar Ridge	10,009
Red Spring	7,847
South Fork Owyhee River	7,842
Owyhee Canyon	21,875
Little Humboldt River	42,213
Rough Hills	6,685
Bad Lands	9,426
Total for Elko District	272,422

8. Recreation- The public lands within the Elko District provide opportunities for a wide variety of recreational activities, including fishing, sightseeing, hunting, camping, white water rafting, photography, rock-hounding, and off-highway vehicle use. There are six Special Recreation Management Areas, four developed campgrounds/recreation sites, and many other undeveloped sites.

9. Visual Resources- Visual resources are identified through the Visual Resource Management (VRM) inventory. This inventory consists of a scenic quality evaluation, sensitivity level analysis and a delineation of distance zones. Based on these factors, BLM administered lands were placed into four visual resource management classes. The majority of the district has been designated as Class IV. The remaining lands are either Class II or Class III. There are no designated Class I areas in the Elko District. WSAs may be managed as Class 1 VRM areas.

The Class I VRM objective is to preserve the existing character of the landscape. This class provides for natural ecological changes; however, it does not preclude very limited management activity. The level of change to the characteristic landscape should be very low and must not attract attention.

The Class II VRM objective is to retain the existing character of the landscape. The level of change to the characteristic landscape should be low. Management activities may be seen, but not attract the attention of the casual observer. Any changes must repeat the basic elements of form, line, color, and texture found in the predominant natural features of the characteristic landscape.

The Class III VRM objective is to partially retain the existing character of the landscape. The level of change to the characteristic landscape should be moderate. Management activities may attract attention but should not dominate the view of the casual observer. Changes should repeat the basic elements found in the predominant natural features of the landscape.

The Class IV VRM objective is to provide for management objectives which require major modification of the existing character of the landscape. The level of change to the characteristic landscape can be high. These management activities may dominate the view and be the major focus of viewer attention. However, every attempt should be made to minimize the impact of these activities through careful location, minimal disturbance, and repeating the basic elements. (BLM, 1986).

10. Wildlife- With the tremendous variation of terrestrial habitats on the Elko District, there is a comparable variety of wildlife species, which include big game, small game, and nongame species. There are approximately 81 species of mammals, 246 species of birds, and 28 species of reptiles and amphibians. The species lists can be found at the BLM Elko Field Office.

Several locally representative species of wildlife are used to illustrate the affected environment. The species used are: pronghorn (*Antilocarpa americana*), elk (*Cervis elaphus*), mule deer (*Odocoileus hemionus*), Great Basin pocket mouse (*Perognathus parvus*), red tail hawk (*Buteo jamaicensis*) and sage grouse (*Centrocercus urophasianus*).

Prescribed fire has been recommended to improve pronghorn habitat. With a preference for forbs and strong requirements for open cover, pronghorns are favorably influenced by the increase in herbaceous material and the reduction of shrubs after fire. Fire has been known to recover long abandoned antelope range in both Nevada and California. Pronghorn require a mosaic of very open spaces and taller, denser shrub areas. Field recommendations are to limit burns in antelope habitat to 1,000 acres with a mosaic pattern to provide for cover for fawning with 5 to 10 percent shrub cover (Fire Effects Information

System - FEIS).

Fire use has been routinely used to create and enhance elk habitat. Following a fire elk forage species are enhanced in quantity and quality (FEIS).

Mule deer habitat can also be improved by the use of fire. Fires that create a mosaic of burned and unburned areas are the most beneficial. Deer tend to prefer foraging in burned areas compared to unburned areas because of the difference in forage selection. Black sagebrush is a critical winter deer forage in Nevada and should not be burned in large tracts. A mosaic pattern in shrub and pinyon-juniper woodlands create openings to attract mule deer to the forage but provide enough shelter for thermal cover and protection for fawning (FEIS).

The Great Basin pocket mouse is not directly affected by fire. They do tend to converge on recent burns probably due to the presence of easily available seed and dead insects. Favorable precipitation after a fire can greatly increase the populations of pocket mice probably due to the increased seed production of the grasses and forbs. These increases tend to be short lived with populations returning to normal within a year of the fire (FEIS).

The red-tailed hawk can be negatively affected by fire if the fire burns occupied nest trees or reduces the number of unoccupied nest trees in an area where they are scarce. Fire can create snags which are used as perch sites and enhance the foraging habitat of the hawks. The hawks also use fresh burns when foraging due to increased prey visibility. Regular prescribed burning has been noted to increase the habitat and populations of the hawks' prey. Prescribed fire should be in a mosaic pattern to maximize the edge effect and vegetative diversity for most benefit to hawks (FEIS).

Depending on pre-fire habitat quality and the type of fire, sage grouse (considered a Nevada BLM sensitive species) can either be positively or negatively affected by fire. Sage grouse use different age classes and stand structures for lekking, brooding, nesting and wintering grounds. Generally, sage grouse prefer relatively open sagebrush vegetation. Neither extensive stands of dense sagebrush nor extensive open areas are favored by sage grouse. Fire that creates a mosaic of different age class and structure of sagebrush benefits sage grouse. Patches of newly burned areas interspersed with patches of sagebrush provides increased forb production while providing nesting and brood cover. Younger age class sagebrush established after a fire provide more nutritious and palatable browse than does old sagebrush. Sage grouse have established lekking areas on new burns in areas where open cover was previously lacking. A fire within a sage grouse area can be beneficial if it does not burn key winter habitat or large tracts of land. Diversity in terms of sagebrush habitat, which include forage and cover areas, should be the management objective. Recommendations have been made to burn sagebrush in sage grouse habitat on a rotational basis to provide the diversity that is needed for the sage grouse populations (FEIS).

11. Threatened, Endangered, Candidate, and Special Status Species - There are 41 state and federal protected or special status plants and animals likely to occur on the public lands in the Elko District (Appendix B). Any action that may affect these species is subject to consultation with the U.S. Fish and Wildlife Service under section 7 of the Endangered Species Act. Land such as terrestrial, wetland, riparian, streams, lakes and reservoirs can provide important habitat for these species. The BLM gives sensitive species special consideration to ensure that their populations do not decline to the point where listing as threatened or endangered becomes necessary.

12. Soils **-** Soils in the Elko District were mapped by the Natural Resource Conservation Service as part of eight different Order III Soil Surveys. Most of them have now been published, with the remainder to be completed with the next year or two. Soils are quite variable, and are influenced by geology, topography, and climate. Specific soil interpretations for things such as productivity and potential for re-vegetation following wildland fire are found by soil map unit in the soil surveys, and are not discussed in this document.

Soils occurring on bolson and semi-bolson floors at lower elevations are deep and young. These soils are poorly drained and are occasionally flooded. They occur on nearly level to gently sloping areas and are characterized by some saline-alkali accumulations. These soils are usually difficult to re-vegetate because of the high salt content.

Soils occurring in floodplains are deep, have a high organic matter content, and may be poorly drained. They are usually young soils with little profile development. They are subject to frequent flooding and generally have a slight wind and water erosion hazard when the vegetation has been removed. These are some of the most productive soils in the district. Sagebrush-perennial grasses and possibly crested wheatgrass seedings would occur on these soils.

Soils that occur on terraces and piedmont slopes are common throughout the district and frequently have sagebrush vegetation. Slopes are quite variable, as well as texture. Soils on tops of fans and terraces tend to be older soils and have silica or lime cemented hardpans, or clay subsoils. These hardpans limit the amount of available moisture, as well as restricting infiltration and root penetration. Wind erosion hazard is slight and water erosion hazard is slight to moderate when the vegetation is removed. Sagebrush-perennial grasses and crested wheatgrass seedings are most likely to occur on these soils.

Soils occurring on mountains and hills may be shallow to deep over bedrock, with or without rock fragments. Textures are variable. Water erosion hazard depends on slope, texture and the amount of rock fragments throughout the soil, and can be moderate to severe. Wind erosion hazard is slight. Mountain soils may have aspen, mixed conifer, mountain brush, and pinyon-juniper growing on them.

Soils in the Owyhee Desert are located on the Columbia Plateau. These soils developed over basalt flows in mixed alluvium and are influenced by loess and ash. These soils are generally shallow over a hardpan or bedrock and have a high surface cobble and/or stone content. Lime or silica cemented hardpans are common on these soils. Wind and water erosion hazard are generally slight. Sagebrush-perennial grass and crested wheatgrass seeding vegetation types occur on these soils.

Cryptogamic crusts are commonly found on the soils in the Elko District. They are frequently referred to as microbiotic crusts. They are composed of various living organisms and their by products. In the Great Basin, *Microcoleus vaginatus*, a cyanobacteria (blue-green algae) composes the vast majority of the crust (Johnson, 1997). Lichens of the *Colleria spp*. and moss of the genera *Totula spp*. are also common (ibid.). These crusts serve many functions including nitrogen fixation, soil stability, changes in infiltration (both increased and decreased), and improved plant health for certain plant species. Fire can cause a decline in cryptogamic crusts. This impact can be severe in high intensity fires, such as those associated with mountain shrub communities. Low intensity fires, such as found in grass/sagebrush communities, would not remove all the crust structure. The cyanobacteria recovers from disturbance most rapidly, attaining undisturbed densities within 1 to 5 years, because the higher pH favors its establishment (Debano, et al., 1998). Algal cells of many species can survive the most severe disturbances (ibid.) Where bacterial populations are reduced immediately post-fire, they typically increase dramatically after the first post-fire rainfall (Clark,1994). There is little research on the lichens that form the cryptogramic crusts. It has been found though, that black lichen was the first plant that rapidly repopulated an area burned by fire in a southern Utah desert shrub community. This was done through seed dispersal from non- burned areas within and immediately outside of the fire (FEIS). It may take years. The time for full crust recovery after a fire depends on fire intensity levels. The response time can be improved by limiting the size of the fire and increasing the mosaic pattern of the burn, so that there is a near by source of inoculum.

The amount of duff consumed by fire is highly dependent on duff moisture content. Duff with a moisture content of 120 percent or greater basically will not burn. At moisture contents of 30 to 120 percent, the amount of duff consumed depends on the consumption rate of the associated surface fuels. Duff with a moisture content of less than 30 percent will burn on its own. (Peterson, 1999)

Approximately eight percent of the heat generated by fire is transferred to the mineral soil. The amount of heat transfer relates directly to the duration of all phases of combustion. The temperatures reached by the soils are also dependent on the amount of duff and organic matter insulating the soil and on the size and length of burn time of the surface fuels that contact the soil (Peterson, 1999). In grass dominated vegetation types the usual maximum heating of the soil is 125° C in 15 minutes. In brush vegetation the maximum temperature is 200° C in 30 minutes. In timber duff, the highest temperature of 400° C is reached after

16 hours during the smoldering and glowing phase of the fire. Most of this temperature heating is within the top 2 centimeters of the soil.

The temperature-induced soil fire effects include chemical and physical changes occurring in organic matter and soil nutrients. At 150°C rapid pyrolysis occurs. At 300-390°C the loss of up to 75 percent of soil nitrogen can occur and the soil pH increases. Long duration heating of 400-500°C causes ashing of organic matter. At still higher temperatures, structural changes in the soil occur (Hartford and Frandsen, 1992).

Hydrophobicity is the result of the distillation of organic compounds that causes soils to develop resistance to wetting. Hydrophobicity also occurs naturally in the absence of fire. The danger of hydrophobicity is greatest for fires occurring in chaparral shrub communities and forested areas. Hydrophobicity may also occur in sagebrush communities. This is generally extremely limited in scope and only occurs where shrubs and basal litter are consumed in a long duration fire (Miller, 1999). This effect causes increased runoff. Hydrophobicity primarily occurs in coarse-textured granitic soils most frequently following fires that heat the soil to 176-204°C. Granitic soils are very limited within the District. The two main areas are approximately 46,000 acres in the Granite Range and approximately 6,000 acres in the Dolly Varden Mountains (Coates, 1987). Fine textured soils with a moderate amount of soil moisture are not susceptible to this phenomenon when the soil temperature remains below 176°C. When the soil is heated above 288° C these hydrophobic compounds are destroyed (Clark, 1994).

The removal of vegetative cover subjects the soil to direct raindrop impact which increases runoff and water erosion. The amount of water erosion will be highly dependent on slope steepness as well as soil texture and severity of the storm event. Water erosion impact can be minimized by avoiding steep slopes, especially where erodible soils are present. Timing a fire when large storm events are not likely to occur will also help. In the long-term, this impact should be positive if post fire vegetation has denser soil surface and subsoil root masses.

13. Wetland and Riparian Zones - There are approximately 30,000 acres of wetlands and riparian zones within the Elko District. These zones are at times inundated by water and normally have saturated or seasonably saturated soil conditions within 10 feet of surface water. The width of the areas varies from a few feet along small streams, ponds and within spring meadows, to several hundred feet along major rivers, lake shores, and within large meadow basins. Many of the riparian areas do not have a surface flow, but are maintained by the high soil moisture. The presence of moisture and abundant nutrients makes the wetlands and riparian areas the most vegetatively diverse communities within the Elko District. Stream bank stability and cover are important for stream shading which contributes to lower (below 70° F.) water temperatures that are critical for fisheries. These zones are valuable for wildlife and aquatic habitat. Wildland fire does occur in these areas, although the moisture present probably reduced fire occurrence and severity.

Typical wetland and riparian vegetation species includes Pacific willow (*Salix lasiandra*), sandbar willow (*Salix exigua*), chokecherry(Prunus virginiana), Wood's rose (*Rosa woodsii*), sedge (*Carex spp*.), Olney threesquare (*Scirpus americanus*), Baltic rush (*Juncus balticus*), bent grass (*Agrostis stolonifera*) and Kentucky bluegrass (*Poa pratensis*).

All of these species are at least moderately fire tolerant. Willows in all stages of vigor re-sprout from the root crown or stem base following fire. Their numerous wind dispersed seeds are also important in re-vegetating areas post-fire. Severe fires that burn off most of the organic layer of the soil and leave roots and stem base exposed eliminate basal sprouting by killing dormant buds. Chokecherry is well adapted to disturbance by fire. It is easily top-killed but re-sprouts vigorously from buds on root crowns and rhizomes. Seed dispersed by mammals and birds, and on site buried seed can be significant modes of post fire regeneration. Recovery is relatively rapid post-fire, with plant numbers and cover densities enhanced for several years. Most rhizomes are buried at least one inch below the surface, suggesting that it can tolerate a severe fire with significant soil heating in the upper inch of soil. If the plant is phenologically active significant damage can occur, although fire rarely burns at this time of the growing season. Studies in Utah show that twice as many shoots were found on a fire site than on a nearby unburned site and that the increased densities were maintained for approximately 18 years until the plants regained pre-fire densities. Wood's rose is typically top-killed by a fire. The plant regenerates by sprouting from the root crowns and underground rhizomes and survives low to moderate intensity fires. In some studies Wood's rose doubled in abundance by the second year post-fire. After high intensity fires the plant recovered to near pre-burn densities by the second post-fire year. Sedges reproduce by both rhizomes and seed. Most sedges show a good resistance to low to moderate intensity fires as long as the organic layer of the soil is left mostly intact. Residual seeds often exist in areas that have become dominated by other plants and readily sprout after the vegetation is burned. Fire does not change sedge composition when it is the dominant or co-dominant species. Seasonality of fire does not appear to matter as long as sufficient moisture is in the organic soil layer to reduce its burning. Olney threesquare's rhizomes are buried up to six inches in the soil; thus they are well protected from the soil heating caused by the fire. Field studies have shown that seeds that have been subject to fire on the moist soil surface or buried up to one inch have slightly higher germination rates than seeds not subjected to fire. Generally only the above-ground parts of the plant are removed by fire. Baltic rush survives fire by sprouting from its extensive rhizome system. Fires in riparian/wetland areas often only top-kill the plants, leaving the rhizomes in moist soil unharmed. Bent grass has a moderate tolerance to fire. There is no information available in the literature on the fire ecology of this species. However a similar species, ticklegrass (*Agrostis scabra*) has been shown to colonize bare mineral soil after a fire. This species is considered to be an increaser species with stolons that are probably killed after a moderately severe fire. This species stores seeds in the soils for short durations. Kentucky bluegrass's response to fire depends on the season of the burn, fire frequency and post fire precipitation and soil moisture. This grass is a cool season perennial and burning in the spring when it is actively growing damages it. Repeated spring burns can greatly reduce density and biomass production. Kentucky bluegrass growing on more mesic sites is more effected than the grass growing in moist swales and riparian areas. Burning when the grass is dormant does not affect it. In the west Kentucky bluegrass is often more abundant on recently burned sites than on similar unburned sites, especially in the sagebrush/grassland communities (FEIS).

14. Vegetation - The affected vegetative communities include the following:

Sagebrush Communities: The sagebrush/perennial grassland is the most extensive community in the area covering approximately 4,500,000 acres. This type occurs from clay pan valley bottoms, to well drained deep soils in valley bottoms, to alluvial fans, and up to ridgetops on all exposures. Slopes range from 2 to 75 percent but 4 to 25 percent are the most typical. Elevations range from 4,000 to 9,000 feet. The accepted ranges of fire occurrence within the sagebrush vegetation types (Miller, 1998) are as follows:

> Wyoming big sagebrush (*Artemisia tridentata spp. wyomingensis*) - from 25 to 100 years. Where shrubs were small in stature and grass sparse due to low site productivity and precipitation, the frequency was closer to 100 years. This sagebrush type occupies approximately 40 percent (1.8 million acres) of the sagebrush dominated areas.
>
> Basin big sagebrush (*Artemisia tridentata spp. tridentata*)- from 30 to 70 years during the pre-settlement period with dry sites burning at greater than 50 year intervals. This sagebrush type occupies approximately 20 percent (900,000 acres) of the sagebrush dominated areas.
>
> Mountain big sagebrush (*Artemisia tridentata spp. vaseyana*) - from 11 to 40 years, the sites closest to Nevada in SW Idaho with western juniper ecotones had an estimated fire return interval of 11 years. This sagebrush type occupies approximately 25 percent (1.1 million acres) of the sagebrush dominated areas.
>
> Black sagebrush (*Artemisia nova*)- estimated fire return intervals of 100 to 200 years. This sagebrush type occurs on approximately 15 percent (700,000 acres) of the sagebrush dominated areas.

Associated with the sagebrush communities are various perennial grass species. Among the most important are: Thurber needlegrass (*Stipa thurberiana*), bluebunch wheatgrass (*Pseudorogneria spicata*), Indian ricegrass (*Oryzopsis hymenoides*), Great Basin wildrye (*Elymus cinereus*), bottlebrush squirreltail (*Elymus elymoides*), Sandberg bluegrass (*Poa *secunda*) and pine bluegrass (*Poa scrabrella*). Important forb species include arrowleaf balsamroot (*Balsamorhiza sagittata*), and taper hawksbeard (*Crepis acuminata*). Potential vegetative composition is about 50 percent grasses, 15 percent forbs, and 35 percent shrubs.

Site productivity affects the burning patterns of the big sagebrush species. Highly productive sites have greater plant density and more biomass, which provides the fuels to carry the fire. Among the three subspecies of sagebrush, mountain sagebrush is the most flammable, Wyoming big sagebrush is the least flammable and basin big sagebrush is of intermediate flammability. All three species are easily killed by fire and reestablish themselves through seed caches and off-site seed.(FEIS)

The black sagebrush communities range from low arid foothills and ranges to high mountain ridges. The perennial grasses associated with these communities are Idaho fescue (*Festuca idahoensis*), Webber ricegrass (*Oryzopsis webberi*), bottlebrush squirreltail, Cusick bluegrass (*Poa cusickii*), Sandberg bluegrass, and pine bluegrass. Potential vegetative composition is about 50 percent grasses, 15 percent forbs, and 35 percent shrubs.

Typically the sparse vegetation of most black sagebrush communities normally precludes the occurrence of fire except in exceptional years. Black sagebrush stands, where they form a major part of the community, are a valuable wildlife winter forage species and should not be burned on a large scale basis.

The grasses associated with these communities are generally fire resistant. Bluebunch *wheatgrass* is a coarse-leafed plant without a lot of fuel buildup around the base, so there are no prolonged high temperatures and most basal buds survive. Tiller production usually increases and biomass increases. Regrowth after a burn shows increased mineral content and lower fiber concentrations than untreated foliage. Great Basin wildrye is generally favored by disturbance. Great Basin wildrye has shown increased foliage production and higher densities after prescribed fires in the Elko District. The plant re-sprouts from buds at the root crown and from new seedlings established from residual plants. This grass is a poor competitor and is suppressed by other species. Bottlebrush squirreltail is one of the most resistant bunchgrasses. It often increases in abundance after a fire. Shoot biomass and density and the number of reproductive shoots may increase dramatically after a fire. *Bluegrass species* are normally unharmed by fire. Their rapid maturation in the spring reduces fire damage since they are dormant during most of the burning season. Bluegrass cover generally increases after a fire. Indian ricegrass normally is only slightly damaged by fire. Early spring burning generally increases the canopy cover and density of this grass. It easily re-seeds from adjacent plants. Idaho fescue can survive low to moderate intensity fires if the basal buds are not damaged. Spring burning has the least effect on this grass. In some areas with more favorable growing conditions, it resembles bluebunch wheatgrass in its ability to withstand fire. In poor sites it is easily damaged. Idaho fescue burned in the

Lone Mountain fire of 1994 on the Elko District recovered to its pre-fire density and biomass within two years of the fire. The needle and thread and needle grasses are the grasses that are most easily damaged by fire. This is due in large part to the dense fine fuels and culms around the bases of the plants. Large plants are the most susceptible due to the greater buildup of fuels. Midsummer fires are the most damaging. For all the grasses it appears that post-growing season fires have the most beneficial effects (FEIS).

The forbs found within this community are generally unaffected by fire or are favored by fire. This is in part to their growth forms and because most forbs are colonizing species.

Pinyon-Juniper: This type occurs in mountainous regions. Closed and open stands of pinyon-juniper cover approximately 1,100,000 acres within the District. Slopes range from 30 to 50 percent, but slope gradients of 30 percent are most typical. Elevations are 5,500 to 9,000 feet. The pinyon, juniper and mahogany types may be roughly divided into three attitudinal belts. On low, dry fans juniper occurs in nearly pure stands. Pinyon and mahogany occur at the higher elevations where the annual precipitation is greater, while in between is a transition zone where the three species mix. The pinyon pine, Utah juniper and inclusions of curlleaf mountain mahogany forest types are distinct ecosystems which are managed and perpetuated for the production of multiple resource values. These values include: wildlife habitat, recreation uses, watershed protection, and wood products including firewood, Christmas trees, posts, pine nuts and wildings.

These plant communities are characterized by Pinyon pine (*Pinus monophylla*) and/or Utah juniper (*Juniperus osteosperma*). On the Elko District most of the woodland sites are dominated by Utah juniper. The understory consists primarily of bluebunch wheatgrass, black sagebrush. Thurber needlegrass, Sandberg bluegrass, Great Basin wildrye, and needle and thread grass (*Stipa comata*) are important species associated with these sites. Juniper and pinyon trees are prevalent enough to dominate these areas however, antelope bitterbrush (*Purshia tridentata*) and curleaf mountain mahogany (*Cercocarpus ledifolius*) can be located within the understory. Potential vegetative composition is about 40 percent grasses, 15 percent forbs, and 45 percent shrubs.

The fire frequency in the pre-settlement period on pinyon-juniper and mahogany varied considerably. Highly productive sites with continuous grass cover probably had a fire frequency of approximately 10 years and restricted pinyon-juniper to rocky outcrops and sites without grass. Fire maintained a savanna plant community of grass with occasional trees. On moderately productive sites it is estimated that there were frequent surface fires ranging from 10 to 30 years with crown fires occurring every 200-300 years. Fires on low productivity sites with discontinuous grass cover probably were small, patchy, and infrequent (Miller, 1998). In the Great Basin woodlands, the best candidates for prescribed fire are areas where juniper is invading the sagebrush-grassland communities. These sites usually have a shrub and tree cover ranging from 45 to 60 percent. These sites can be burned with low intensity spring burns to eliminate the encroaching small (up to 4 feet high) tree overstory.

Aspen: Many areas in the mountains have small stands of aspen (*Populus tremuloides*) and/or cottonwood (*Populus spp.*). It is estimated that approximately 17,000 acres of aspen are found on the District. The understory consists of forbs such as aster (*Aster spp.*), lupine (*Lupinus spp.*), fireweed (*Epolobium spp.*), and geranium (*Geranium spp.*), but is often dominated by snowberry (*Symphocarpus spp.*). Some common grasses which may be present are smooth brome (*Bromus marginatus*), slender wheatgrass (*Agropyron trachycaulum*), and blue wildrye (*Elymus glaucus*).

Aspen is usually killed by fire and regenerates by root suckers. Fire frequency is determined by aging the stand to see when it originated. In the intermountain west aspens mature and start declining at 80 to 100 years. As the aspens mature they become susceptible to insects and disease. Stands may be lost when conifers invade and shade out the aspen. In sagebrush areas the stands may break up and convert to shrub dominated vegetation (Miller, 1998). Aspen is a fire dependent species requiring fire to rejuvenate the stand and to eliminate encroaching vegetation. Aspen is highly competitive on burned sites. Even when there is little detectable aspen on a site it may dominate after a fire. Given adequate rest, the recovery is good and the potential exists for increasing the total acreage of aspen within an area.

The primary grasses in the aspen community easily regenerate after a fire either through their rhizomes or through seeds. Smooth brome is negatively affected by early spring burns. The seed bed after a fire is particularly conducive to the establishment of blue wildrye. After approximately four growing seasons blue wildrye is suppressed by smooth brome which out competes it. (FEIS).

The forbs within this community are all fire resistant with fireweed and lupine being aggressive colonizers after a fire either though sprouting or seeds. Asters are moderately resistant due to their rhizomes and the population increases rapidly after a fire due to mass flowering and seed production in the first two years post fire (FEIS).

*Mixed Conifer***:** The mixed conifer community occupies approximately 47,000 acres on the District. Tree species include limber (*Pinus flexilis*) and whitebark (*Pinus albicaulis*) pines, white fir (*Abies concolor*), subalpine fir (*Abies lasiocarpa*), Englemann spruce (*Picea englemannii*), and at the highest elevations bristlecone pine (*Pinus longaeva*).

All age classes of the various conifer species are represented, with the majority being mature (100 to 300 years old). These forests are found from 5,000 to over 10,000 feet in elevation, where precipitation is the greatest, however, they will extend down mountains to lower elevations (in areas such as drainages or north slopes) where moisture is adequate. Quigley and Haynes (1996) show that the type of fire regime within this vegetation type in the Jarbidge area of Northeast Nevada (the closest area with similar forested types to the Elko District) has changed from non-lethal to lethal over the past 50 years. This is probably due to the buildup of fuels and the conversion of parts of this forest from pine-dominated open stands to a closed-stand forest with a higher concentration of fir and spruce trees with more stems per acre. Of concern is that the "islands in the sky" areas of mixed conifer in the Elko District are remnant stands of a previously larger vegetation type. A stand replacement fire occurring in these remnant stands may totally change the vegetative community, losing a potentially valuable resource.

Limber pine is susceptible to fire when it is young. The older trees have bark up to 2 inches thick which acts as insulation and protects the trees from stem scorch. The terminal buds are somewhat protected from heat associated with crown scorch by tight needle clusters. The vulnerability of limber pine to fire is reduced by the open structure of the stand and the sparse understory. The fuel loadings are generally light, leading to low intensity understory fires. Studies in Montana show a fire frequency of 50 to 200 years. It is suggested that limber pine growing in open stands may be maintained by periodic surface fires which reduce the undergrowth (FEIS).

Whitebark pine is a moderately fire resistant species and is favored by both creeping ground or surface fires and severe stand replacement fires. Its susceptibility to fire is reduced by the open structure of its stands and the dry exposed habitat with a sparse understory. Whitebark pine is favored by severe stand-replacing fires, especially in moist sites where succession to more shade tolerant species such as white fir is apt to occur. Fire scar studies have shown a relatively infrequent 50 to 300 year fire frequency. With the lengthening of the fire return intervals, older stands are more susceptible to bark beetle infestations which advance succession to shade tolerant species. The regeneration of whitebark pine in small openings is probably due to surface fires. Whitebark pine's perpetuation in moist sites where succession to shade tolerant species is rapid is probably due to severe fires. The occurrence of whitebark pine in association with Englemann spruce in subalpine basins and north slopes is probably the result of fire (FEIS).

White fir (in the Elko area often genetically mixed with subalpine fir) is a shade tolerant species that thrives with the lack of fire. It rapidly invades pine sites in the absence of fire. Sapling and pole sized trees are very fire-sensitive because of their thin bark and low hanging branches, which easily ignite from surface fires. As the bark thickens they achieve more fire resistance. Small patches of mature white fir survive fire and provide a seed source to re-colonize the site. In the Sierra Nevada Mountains, the closest studied site with similar environmental conditions, the fire frequency was from 6 to 20 years. This fire frequency kept the fire intensity low as there was little fuel build-up. This regime kept the forests in open pine and Douglas fir dominated stands. Today's heavy fuel accumulations and thick "dog hair" stands greatly increase the chances for high intensity stand replacement fires.

Englemann spruce is very sensitive to fire and is generally killed by even a low intensity fire. Post-fire establishment of seedlings is through seed dispersal from remaining mature trees. Pockets of Englemann spruce stands that escape burning are generally in moist sites where fire spread is limited. In subalpine sites the spruce escape fire because of the discontinuous fuels, moist environment, and the broken and rocky terrain. Englemann spruce probably has a fire frequency of from 150 years or more. Many of the Englemann spruce stands are even aged, suggesting that they developed after a fire (FEIS). In the Cherry Creek Mountains on the Elko District, Englemann spruce trees were observed to have healed fire scars on healthy mature trees from low intensity surface fires. This suggests that low intensity, surface fires have occurred in this forest type as well as the usual stand replacement fires.

Subalpine fir (in the Elko area often genetically mixed with white fir) is very sensitive to fire and generally has a high mortality from even low intensity fires. Subalpine sites are moist, with the lower, warmer sites experiencing shorter fire return interval with a lower intensity. Areas with fire return frequencies of 20 years or less keep the areas dominated by seral conifers. Sites at higher and cooler elevations are subject to stand replacement fires occurring from 90 to 350 years (FEIS).

Bristlecone pine generally occurs in habitats where fuels to carry fire are basically non-existent. Fires with enough intensity to result in crown fires rarely occur in the grass dominated understory. Surface fires in these areas are low intensity, slow burning and very infrequent (FEIS).

A species that may have been present but now probably missing from this community is the inland Douglas fir (*Pseudotsuga menziesii var. glauca*). This lack may be due to successional change to more shade tolerant species coupled with it's highly desirable wood characteristics which led to it being harvested. The last known stands of Douglas fir were harvested in the 1970's from the Ruby Mountains. Douglas fir has existed in this area and still may be found in an occasional isolated area. Douglas fir is among the most fire tolerant tree species in the Great Basin with the larger trees having thick bark that serves as insulation. Low intensity surface fires tend to reduce fuel levels and keep Douglas fir stands open. On sites where Douglas fir is a seral species (such as subalpine sites and/or north facing slopes) seedling establishment tends to be better after a fire. Large high intensity fires tend to reduce seedling establishment and favor Englemann spruce and subalpine fir (FEIS).

Observations have been made of multiple, small, low-intensity surface fires ranging from 10 to 60 years ago in mixed conifer areas within the Elko District (Goshutes, Pequops, Cherry Creek and Spruce mountains). This is in addition to larger block fire scars (up to 40-60 acres) that were of the stand replacement category.

Mountain Brush: This type occurs on upland terraces and in mountain valleys and slopes of all aspects. Areas of this community occur throughout the District often in association with mountain big sagebrush. Slopes range from 4 to 50 percent, but are mostly about 30 percent. Elevations are 6,000 to 9,000 feet. The primary species present are serviceberry (*Almelanchier utahensis*), antelope bitterbrush, curlleaf mountain mahogany, oceanspray (*Holodiscus discolor*) and snowberry (*Symphoricarpos spp*.).

Serviceberry is damaged by wildland fire but is a vigorous re-sprouter that will resprout after a wildland fire. It can also remain in a suppressed state in a closed stand of conifers for a long time and canopy removal by fire will stimulate sprouting (FEIS).

Bitterbrush is often killed by fire. It either regenerates by sprouting after a fire or from on-site rodent caches and off-site seed sources. The erect form found in this part of the Great Basin is less likely to sprout than low lying forms found in other areas. Spring fires are less damaging to bitterbrush than either summer or fall burning. Even though bitterbrush is often killed by fire, it occurs in communities with a high fire frequency. Fire may be necessary to maintain populations of bitterbrush by providing bare mineral soil and in decreasing vegetative competition. Bitterbrush stands in juniper are sensitive to fire but the long term survival appears to depend on seral, fire generated conditions (FEIS). Bitterbrush in a prescribed fire in the Stormy area of Elko District has been observed to sprout after a September prescribed fire.

Curlleaf mountain mahogany is usually killed by fire. Seedlings do establish after a fire primarily by off-site seed and sometimes by resprouting. Studies in western and central Nevada on the Shoshone Range (the closest studied area to the Elko District), indicate that fire was infrequent in old growth stands probably due to the lack of surface fuels and also growing on extremely rocky "fire proof" sites. Burning is generally only recommended in sites that have been invaded by conifers, so that competition is reduced and mineral soil is made available for seedling establishment (FEIS).

Oceanspray is well adapted to fire. It is a vigorous re-sprouter and is generally resistant to fire mortality. Post-burn recovery is usually rapid, dependent on the amount of mineral soil exposed. Fall burning appears to have a more positive effect on this plant than burning at other times of the year (FEIS).

Snowberry is moderately resistant to fire and resprouting has been documented in Nevada. Spring burning in Idaho in mountain big sagebrush and Idaho fescue on sites similar to those found within the Elko District, has shown increased coverage of snowberry. Studies within pinyon-juniper woodlands show a significantly higher occurrence of snowberry than on adjacent mature woodlands (FEIS).

The grasses in this plant community are characterized by Idaho fescue, bluebunch wheatgrass, and mountain brome (Bromus marainatus), with mountain big sagebrush being an important species associated with this site. Brush species dominate the area. Potential vegetative composition is about 55 percent grasses, 15 percent forbs, and 30 percent shrubs.

Crested Wheatgrass Seedings: Approximately 390,000 acres within the District has been seeded to crested wheatgrass (*Agropyron cristatum* and *Agropyron desertorum*) Fire on these sites remove the encroaching sagebrush vegetation and maintain the seedings as a grassland with excellent recovery potential following the fire. Crested wheatgrass is resistant to fire because it maintains a high moisture content through most of the summer wildland fire season. Recovery after fire is usually rapid. Crested wheatgrass is a long-lived perennial bunchgrass that is tolerant of fire when dormant. The plants have coarse stems and leaves that burn quickly with little heat transfer to the basal buds. This grass has the capacity for rapid new tiller formation, preventing the depletion of stored nutrients. It also allocates plant resources to new tiller development and curtailing root system growth. Post fire response is considered to be rapid. Some studies have indicated that late summer burning favors this grass (FEIS).

15. Noxious Weeds- A noxious weed inventory has been completed on approximately 5 million acres of public lands within the Elko District as of August, 1998. Preliminary findings from this inventory and available literature suggest that most noxious weeds occur on disturbed areas frequently used by livestock, wildlife and humans. Examples of disturbed areas include roadsides and right-of-ways along primary and secondary roads, gravel pits, salt licks, recreation sites, spring sources, water sources and trails. Many of the 38 species of Nevada Noxious Weeds listed in the Programmatic Environmental Assessment of Integrated Weed Management on Bureau of Land Management Lands are common throughout the Elko District (See Appendix C). If a disturbed area that is infested and dominated with noxious weeds is burned, the noxious weeds will rapidly reestablish, out-competing the remnant native vegetation. If the area has a good seed source of native desirable species, chances are the native desirable species will return and out-compete the noxious weeds.

16. Wild Horses - Approximately 3,600 wild horses are currently found in eight (8) herd management areas (HMA) in the Elko District. The HMAs encompass approximately 22 different grazing allotments and are dispersed throughout the entire District. Wild horses typically inhabit the mountains during the summer months and can be found on the valley floors during the winter. Their habitat ranges from the pinyon-juniper woodlands to the desert shrub/salt brush vegetation communities.

Horse Management Areas

HMA	Acres	Population
Antelope Valley	462,040	599

Goshute	250,800	564
Spruce-Pequop	138,000	286
Maverick-Medicine	285,960	390
Rock Creek	115,500	802
Little Humboldt	64,075	355
Owyhee	371,000	556
Diamond Hills North	70,000	36

17. Livestock - Within the Elko Field Office, BLM the total permitted use in Animal Unit Months (AUMs) allocated to domestic livestock is currently 737, 983. The total permitted use is allocated between 235 grazing allotments grazed by 181 livestock permittees. The average AUM for sagebrush-perennial grass communities is approximately 0.12 per acre. The AUM for pinyon-juniper and mixed conifer forests is approximately 0.06 per acre.

18. Socio-Economic Conditions- All of Elko county and the northern portions of Lander and Eureka counties are within the boundaries of the Elko District. The main employment categories within this area are; service industries (41.1%), total trade categories (19%), local government (12.3%), mining (7.7%) and construction (7.3%). According to the State Division of Water Planning, 51,855 people live in Elko county (Horton, 1998). The total populations for Lander and Eureka counties are 7,030 and 1,660 respectively with most of this population occurring outside of the Elko District boundaries.

B. No Action Alternative

The description of the affected environment for the No Action Alternative would be the same as for the proposed action.

IV. Environmental Consequences:

The environmental consequences, including cumulative impact analysis, are based on the following assumptions:

1. The population growth of the area will remain relatively constant.
2. The climate will remain constant.
3. The time frames examined in the cumulative impacts sections will be limited to a 20 to 40 year ecological time frame.
4. Land ownership and land use patterns will remain relatively constant.

1. Air Quality:

A. Proposed Action -There would be some short-term air quality degradation within the area of a prescribed fire. In the brush and grass vegetation types, smoke would dissipate rapidly and should be gone by the next day. In the pinyon-juniper and mixed conifer types, there would be some residual smoke for one to five days after the prescribed fire. Prescribed burning generates approximately 70 to 75 percent of the PM10 emissions per acre that a wildland fire does. Unforeseen weather changes may cause smoke to impact sensitive receptors.

Because wildfire is a natural part of the Great Basin's vegetation types, the smoke impacts on air quality can be considered a part of the pre-existing air quality conditions. The long-term effects of the prescribed fire program would create a mosaic of fuels which would lessen severe fire occurrence. In the long term (20 to 40 years) this would reduce the severity of wildfires as the fuel loading decreases and would reduce total smoke emissions.

Cumulative Impacts: Some research shows a long term decrease in emissions if prescribed fire is used. It is not possible to accurately predict the cumulative impacts at this analysis level and any prediction of cumulative impacts at a site specific level would not be reliable. Public and private lands are experiencing an increase in prescribed burning. The increase in prescribed fire acreage may lead to a higher possibility of smoke impacts on sensitive receptors.

Residual Impacts: Potential short-term residual impacts would be some smoke degradation of the air resource for a period of from several hours to several days at the burn site. No long-term residual impacts would be expected.

B. No Action Alternative - The lack of prescribed burning on the Elko District would lead to further accumulation of fuels increasing the number and acreage of severe fires which would be concentrated during July and August. This would lead to increased air quality problems during these months and over the long term could increase total smoke emissions.

Cumulative Impacts: The amount of smoke produced by wildfire exceeds that of prescribed fire on a per-acre basis. This could lead to greater degradation of air quality during the limited active fire season (July-September). The resulting long-term cumulative impact could be that of increasing total smoke emissions which would impact sensitive receptors to a greater extent.

Residual Impacts: See Proposed Action.

2. Native American Consultation/Religious Concerns:

A. Proposed Action - If unknown sites are present in a prescribed fire area, there may be negative impacts on the site. This would be based on damaging artifacts within the area, burning of important plant species, or in changing the religious ambience of the site. The Operational Procedures/Project Design (II-2) includes cultural inventory of proposed prescribed fire sites, so this impact would be avoided prior to any prescribed fire.

Cumulative Impacts: No cumulative impacts are expected. If there is a potential for cumulative impacts from multiple prescribed burns, a cumulative assessment study area will be determined and an analysis done.

Residual Impacts: No residual impacts are expected.

B. No Action Alternative - The continued buildup of fuels could lead to larger severe fires that would make it impossible to protect sites of religious value to Native Americans.

Cumulative Impacts: Fuel buildups would lead to more intense fires impacting religious sites on a larger scale than present.

Residual Impacts: Important religious sites could be damaged or lost due to severe wildland fire.

3. Cultural Resources:

A. Proposed Action - The effects of fire on cultural resources are variable. Many factors, including the types of cultural resources, fire history, vegetation types, fire intensity, duration of high heat, soil types, topography, and suppression/containment methods used. must be considered.

Direct impacts include those caused by the fire to the contents of historic properties. Structures, features and artifacts made of organic materials such as wood, shell, bone, antler, horn, plant fiber, hide and cloth are highly susceptible to fire and can be destroyed or severely damaged by both wildland and prescribed fires.

Rock art sites are also susceptible to damage by fire. Painted elements (pictographs) can be soot blackened, scorched or completely burned away, while pecked elements (petroglyphs) on friable stone such as sandstone and limestone can exfoliate (Morris 1992.15, Conner et al. 1989:298). Rock art is often located on vertical faces of boulders or cliff faces where heat intensity is greater than found near the ground surface. Another resource found in cliffs and caves is wood rat middens, the accumulated plant remains and other debris cemented by wood rat urine, that are used for paleo-environmental studies. Wood rat middens can survive for thousands of years; one in the Elko District dates to 50,000 B.P. These middens, essential for reconstructing past environments, are very susceptible to burning.

The fire history of the Elko District and the effects it has had on cultural resources is a vital component of the cultural resource history. There is evidence to support the existence of repeated wildfires in northeast Nevada. It is not uncommon to find thin lines of charcoal exposed in arroyo cuts, marking episodes of prehistoric burning. Often more than one episode is visible in the exposure. In the pinyon-juniper forests ancient burned-out stumps can sometimes be found among mature stands of trees. Thermal damage to artifacts in archaeological sites may be a direct line of evidence for burning of cultural properties. Artifacts exhibiting crazing or pot lid scars, although not abundant, are routinely encountered in archaeological sites. Intentional heat treatment may account for some of this damage, but wildland fire is probably the more common cause.

Because fire was a major component of the ecosystem, few cultural resources over 150 years of age would have escaped burning. Most would have burned multiple times. If effects from prescribed fires are anticipated to be the same as those in the past, except in those obvious cases where fire has not played a role in site formation, there might be no need to consider these effects further.

Both wildfires and prescribed burns remove vegetation, exposing the soil to erosion. Erosion either by wind or water can damage cultural properties. Artifacts may be moved from their original locations or become mixed with artifacts from other strata. Perishable materials (charcoal, bone, shell, pollen, etc.) may become exposed and subjected to the elements and eventually be destroyed.

Another effect of vegetation removal is the exposure of artifacts and features that were previously obscured. While exposure can be beneficial, allowing a more comprehensive recording of the site, the negative aspect is that sites are also exposed to artifact collectors.

Many factors must be considered when evaluating the effects of prescribed fire on cultural resources. The factor with the greatest potential for major impact often is the fire team and the equipment used to implement the burn project. If the human element is controlled, the factor of most concern is the intensity and duration of the fire. High-temperature fires have the greatest potential to damage most classes of archaeological artifacts and features. The longer high heat is in contact with the artifacts and features, the greater the damage. The fuel load, fuel type, fuel moisture, amount of surface litter, topography and weather conditions determine the intensity and duration of the burn. Surface temperatures encountered during typical rangeland fires are between 100°C and 388°C. If organic materials are not located within the prescribed burn boundaries and if the fire temperature is below 350°C at the level of the artifact, the effect on cultural resources will be minimal (Knight 1994:39).

Cumulative Impacts: The operational design features to identify and protect cultural resources are in the proposed action. Because of this, there will be a greater amount of inventory done within the Elko District, increasing the knowledge base of types and locations of cultural resources.

Residual Impacts: Based on the operational design features of the proposed action there are no expected residual impacts to cultural resources.

B. No Action Alternative - The lack of prescribed fire would allow fuels to accumulate so that when a wildfire did occur the potential negative effects could be greater due to the higher fire temperatures. Although fire was a major component of most past Great Basin ecosystems, the intensity of prehistoric fires is thought to have been less than modern fires. The shift in intensity is attributed to suppression of wildfire during the historic period which has allowed for greater fire loads to accumulate. Rather than a series of frequent small fires, modern fires tend to be less frequent but large and intense. Consequently, the effects to cultural resources by modern wildland fires may be more severe than anything experienced in the past.

Cumulative Impacts: The cumulative impacts could include loss and damage of undocumented and documented sites as wildfire acres and severity increase.

Residual Impacts: Residual impacts could include damaging/destroying cultural resource sites reducing their integrity. This would be due to increased severity of wildfire that cannot be mitigated.

4. Lands:

A. Proposed Action - Hazardous fuel accumulations on public lands would be treated, reducing the possibility of fire negatively impacting private lands. Private land owners and the BLM could cooperate on prescribed fire projects that would benefit the vegetation and uses on adjoining lands. The urban interface is a growing problem in within the District.

Using prescribed fire to reduce these hazards would be beneficial to the communities involved. The authorized land uses within the Elko Field Office would not be affected.

Cumulative Impacts: Cumulative impacts could include greater public and private sector interaction to reduce fire hazards and increase productiveness of adjoining lands.

Residual Impacts: No residual impacts are expected.

B. No Action Alternative - There would be no option to cooperatively work with private landowners and the public to reduce fuel hazards or to improve vegetative conditions by working together on prescribed fire projects. Continued fuel buildup could lead to more severe fires that would escape initial attack and threaten private lands, rights-of-way and other land uses.

Cumulative Impacts: The potential impact of fires starting in heavy fuel concentrations on public lands which would then threaten private lands would likely increase.

Residual impacts: Increased rehabilitation costs on private lands and loss of private land uses would likely result from increased severe wildland fire in the urban interface.

5. Water Resources:

A. Proposed Action - The use of prescribed fire could increase water availability in soils by removing deep rooted, heavy, water-using species and replacing them with increased grass and forb cover. Fire, whether natural or prescribed, directly effects the vegetative cover, thus affecting runoff and infiltration. Short-term effects on surface waters would include increased surface runoff and the associated increased turbidity from sediment in stream flows, greater peak flows and total discharge, and increased nutrient levels in streams. Long-term effects would be less surface runoff with increased herbaceous cover and a concomitant decrease in sediment moving into stream channels. Hydrophobic soils would show the greatest short term impacts in reduced infiltration and increased runoff.

Cumulative Impacts:.Changes in grazing management practices and the use of fire could lead to increased grass and forb cover, reduced surface runoff, and reduced sediment and nutrient loading.

Residual Impacts: If natural re-vegetation does not occur and vegetative cover is not re-established, there could be increased runoff and sedimentation in surface waters.

B. No Action Alternative - Continued build up of fuels could lead to more severe fires, causing greater loss of vegetation and slower vegetative recovery. This could lead to greater peak and total stream discharge, a possible increase in stream temperatures, and an increase in nutrient and sediment loading. Mechanical or chemical buffer strips would have to be used around perennial streams to reduce the effects of wildland fire. Negative impacts would be the greatest in steep watersheds and following high-severity fires.

Cumulative Impacts: The loss of vegetative cover along stream channels could negate the impact of changing grazing management patterns to improve stream-side habitat and condition.

Residual Impacts: The threat of severe wildfires could increase under this alternative. It could increase the likelihood of impacts to water resources by increasing turbidity, siltation and changing the timing of peak flows.

6. Wild and Scenic Rivers:

A. Proposed Action - Prescribed fires would help maintain the plant diversity and health of fire-dependent ecosystems in the Wild and Scenic River corridor. Management ignited prescribed fire probably would not be a viable option within the confines of the South Fork Owyhee River canyon because sparse fuels would limit the fire spread and its effectiveness. There are some open slopes and small basins where management ignited prescribed fire could be used. The use of naturally ignited fire within the eligible river corridor would not affect the scenic, recreation, geologic, fisheries, wildlife, or cultural values associated with this river. The effects of prescribed fire within the WSAs encompassing the South Fork Owyhee River and Fourmile Creek are discussed below. Because the eligible rivers are within existing WSA's, WSA Interim Management Guidelines would apply.

Cumulative Impacts: Under WSA guidelines, fire is allowed as a natural part of the ecosystem. If appropriate grazing management systems are used to improve riparian areas of the river, the cumulative impacts would be that of restoring the native vegetational mosaic of the area and improving riparian habitat.

Residual Impacts: If appropriate grazing management systems are not in place, natural fire may impact the riparian areas putting them at risk for vegetative loss, channel down-cutting, accelerated rates of erosion and increased sediment loading.

B. No Action Alternative - Under this alternative, the potential for large fires to reduce the scenic, fisheries and wildlife values of the eligible river segments exists because the buildup of natural fuels would likely burn hotter and leave less of a mosaic pattern in the open slopes and interior basins. This could lead to fire burning the entire river corridor.

Cumulative Impacts: Appropriate grazing management systems may improve the riparian habitat, however if the uplands do not have a vegetative mosaic the possibility exists for a wildfire to damage the riparian areas.

Residual Impacts: See residual impacts from Proposed Alternative.

7. Wilderness:

A. Proposed Action - Prescribed fire could help maintain the plant diversity and health of fire-dependent ecosystems in WSAs. This could improve or enhance the WSA's naturalness through the restoration of native plant communities. It could also be used to limit the size of stand replacement fires in WSAs with mixed conifer communities by reducing fuel continuity and fuel loading.

Cumulative Impacts: The long term use of management ignited and natural ignition prescribed fire would increase vegetative mosaics, and reduce fuel loading and continuity. This would assist in the restoration of native plant communities and fire frequency return intervals.

Residual Impacts: No residual impacts are expected.

B. No Action Alternative - Under this alternative, the use of fire to improve or enhance the naturalness of the WSA would not be available. The potential for stand-replacing fires would continue in the mixed conifer communities.

Cumulative Impacts: The effects of past, present and future fire suppression activities would be that of increasing fuel loadings and continuity and increase the possibility of large stand-replacement wildfires. Long-term fire suppression activities would also change the vegetative composition of the WSAs. They would move toward a climax community, which differs from the disturbance-based communities that exist naturally.

Residual Impacts: Residual impacts would result in further changes from the pre-settlement vegetation of the WSAs. A severe intensity wildfire could lead to the colonization of the areas by non-native plant species.

8. Recreation:

A. Proposed Action - Prescribed fire would displace dispersed recreation users from burned areas for several years after a fire. In the long-term, recreation use of prescribed fire areas may increase because of improved wildlife habitat. Prescribed fire in or near developed recreation sites could affect the quality of a visitor's experience because of smoke, health, and safety concerns. Protection of developed recreation sites could be improved through the use of prescribed fire to create fire breaks around these areas.

Cumulative Impacts: Prescribed fire could improve wildlife habitat by increasing recreational hunting activities. Vegetative mosaics resulting from prescribed fire could improve the numbers of wild flowers and non-game species for viewing.

Residual Impacts: No residual impacts are expected.

B. No Action Alternative - The potential for large fires which could affect both dispersed and developed recreation would continue to increase. In the long-term, dispersed recreation use could decrease as wildlife habitat degrades and areas become unattractive for recreation. Safety concerns would be raised if wildfires occurred in or near developed recreation sites.

Cumulative Impacts: Increasing visitor use could potentially expose more people to severe wildfires which could create additional safety hazards for the public.

Residual impacts: Long-term degradation of recreational opportunities could result if large wildfires negatively impact large areas of dispersed recreation.

***9. Visual Resources*:**

A. Proposed Action - The use of prescribed fire could result in form, line, color, and texture contrasts. In general, these contrasts would be on a small scale, because of the size of the prescribed burn units. Form contrasts could arise from fingers of burned areas within a landscape of generally small, irregular patches of vegetation, soil, and rock outcrops. Constructed fuel breaks could create line contrasts. Color contrasts would result when the patchy black landscape is compared to uniform gray-green vegetation. The alteration of smooth to moderately rough vegetation to a rougher landscape could result in texture contrasts. Class I VRM objectives could be met because the action would preserve the existing character of the landscape by allowing for natural ecological change while not precluding limited management ignited prescribed fires. Class II, Class III, and Class IV VRM objectives could also be met.

Cumulative Impacts: No cumulative impacts are expected.

Residual Impacts: No residual impacts are expected

B. No Action Alternative - Under this alternative, the potential exists for large fires which could blacken thousands of acres. Form, line, color and texture contrasts with the characteristic landscape could result. Form contrasts could arise from the large, irregular shapes of burned areas in a landscape of generally small, irregular patches of vegetation, soil, and rock outcrops. Constructed fuel breaks could create line contrasts. Color contrasts could result when the patchy black landscape is compared to uniform gray-green vegetation. The alteration of moderately rough vegetation to a smoother, more uniform landscape would result in texture contrasts on a large scale. Class IV and Class III VRM objectives would be met. Class I and II VRM objectives may not be met.

Cumulative Impacts: The vegetation would change toward a climax community with a change in texture of the landscape.

Residual Impacts: Expected to be the same as cumulative impacts above.

10. Wildlife:

A. Proposed Action - In general, wildlife responds well to recently burned habitat. Burned areas usually quickly produce an abundance of grasses and forbs. However, woody species that are burned and do not resprout can be lost as browse for a longer period of time. This could cause a detrimental effect on big game winter ranges. A small, block-mosaic design and avoidance of important upland browse zones, fawning, and upland game bird nesting areas would minimize detrimental effects on wildlife habitat. The mosaic patterns created by prescribed fire would insure that vertical contrast would be created. Contrast is needed for thermal cover, escape routes, and hiding areas. Mosaics and contrast are also needed to create ecotones where species of different communities interact. Impacts to the majority of wildlife species would be short-term. Limited mortality of reptiles and birds may occur. Some species shift may occur, when, for example, burned areas provide attractive foraging areas for antelope by improving production and diversity of grasses and forbs.

The proposed action could increase brood rearing and roosting habitat for sage grouse. The potential impact to sage grouse resources would be significantly reduced by avoiding known sage grouse leks and brood areas. There would be potential to adversely impact sage grouse resources if large prescribed fires are planned in sage grouse habitat. Planning small burn units in these areas would reduce the likelihood of this occurrence. One of the primary objectives of the proposed action is to create a diverse age class structure of sagebrush in a mosaic pattern. This would provide more diverse habitat for sage grouse and other wildlife species.

Cumulative Impacts: The Elko District has created over 20 wildlife water catchment areas for wildlife and has used brush beating and some chaining in the past to improve wildlife habitat. Currently, approximately 30 acres of selective cutting is done per year to improve wildlife habitat. Seed mixes used on all fire rehabilitation and range seedings are “wildlife friendly” seed mixes. All Allotment Evaluations have specific wildlife habitat sections. The cumulative impacts of these techniques combined with prescribed fire would be to increase wildlife habitat diversity and condition.

Residual Impacts: No residual impacts are expected.

B. No Action Alternative - This alternative would limit the tools available to treat wildlife habitat areas to create the desired mosaics that favor wildlife. Continued fuels buildup would increase fuel loadings so when a wildfire occurred it could burn at higher intensity levels over larger areas. This would lessen the chance of creating a mosaic pattern favored by wildlife.

Cumulative Impacts: Past, present and future suppression efforts would lead to heavier fuels buildup which when burned could create larger areas lacking in the edge and structure that many wildlife species prefer.

Residual Impacts: Potential loss of wildlife habitat could result if the vegetative structure changed to closed canopy brush as a result of large fires. This could decrease vegetative structure and edge effects used by wildlife.

11. Threatened, Endangered, Candidate and Special Status Species:

A. Proposed Action - Unknown populations of special status plant and animal species in or near a treated site could be impacted, depending on the habitat requirements and reproductive ecology of a particular species. The probability of impacts to special status plant and animal species would be low because each proposed project would be screened for potential impacts to threatened, endangered and special status plants and animals during the site-specific environmental analysis process. If special status animals or plants were found in a proposed burn area, the burn plan would be modified as per the Operational Procedures/Project Design (see page II-2).

Cumulative Impacts: The expected cumulative impacts for wildlife species would be the same as the Wildlife Proposed Action cumulative impacts. Plant species requiring fire as part of their ecological cycle would be enhanced by a long-term burning program. Past suppression efforts may have reduced their niches. Plants which do not have fire-adapted characteristics could be damaged if the operational design features are not followed.

Residual Impacts: No residual impacts are expected.

B. No Action Alternative - Fuel loadings would continue to increase, possibly leading to severe fires that could damage critical habitat for threatened and endangered species that have been identified in the Elko District (See Appendix B). The options for improving or expanding the wildlife habitat for these species would be limited to mechanical, chemical and grazing methods with the exclusion of prescribed fire. This could decrease the chances that these species could be removed from listing.

Cumulative Impacts: Past, present and future fire suppression efforts could reduce the range of fire adapted species by changing the habitat and reducing the ecological niches that these species use.

Residual Impacts: Residual impacts would be the same as the cumulative impacts listed above.

12. Soils :

A. Proposed Action - The effect of prescribed burning on soils in the area varies depending on the soil type, soil moisture conditions, and severity of a burn. Burned areas with extensive cryptogamic soil crust removal could experience increased runoff and soil erosion, less nitrogen fixation, and decreased plant health for certain species. The vast majority of the soil crusts within the Elko District are composed of crynobacteria which typically recover within 1 to 5 years after a fire. This temporary soil crust impact would be less severe than impacts from larger wildfires after many years of fuel buildup.

Following the reestablishment of vegetation, the wind erosion hazard would be lower than the pre-burn condition. Grasses would provide more surface cover to protect the soil surface from the effects of wind.

Prescribed burns in closed canopy pinyon-juniper communities could cause reduced infiltration and increased soil carbon, potassium, phosphorus, and nitrogen levels during the first year. Runoff could carry potassium and phosphorus away.

Soil temperature would increase both during and after a fire. After a fire, the presence of dark, burned material on the soil surface usually would cause the soil to heat up faster than vegetated or unburned soil. The effects of soil heating vary according to how hot the fire burns. Soil heating impacts would be expected to be greatest in vegetation types where there is a heavy duff buildup. This is primarily found in the mixed conifer, closed canopy pinyon-juniper and mountain brush communities.

Cumulative Impacts: Appropriate grazing management strategies in conjunction with prescribed fire could lead to a higher herbaceous vegetative cover reducing the effects of wind and water erosion on the rangelands.

Residual Impacts: No residual impacts are expected.

B. No Action Alternative - The lack of prescribed burning on the Elko District would lead to further accumulation of fuels, increasing the potential extent of severe fires which would be concentrated during July and August. This is the same time of year when high-intensity precipitation events are most likely to occur. If a high-intensity rain occurs following a severe fire, and before vegetation is reestablished, increased water erosion could be quite significant, especially on steep slopes. Impacts on cryptogamic crusts could be severe if burning of heavy fuels produce soil temperatures of 176°C or higher. Low-intensity fires do not remove all the crust structure which allows them to regrow quicker. This is not the case for a more severe fire when crust removal would likely be more extensive.

Cumulative Impacts: The absence of prescribed fire and suppression efforts in areas that are being encroached upon by juniper would lead to higher fuel buildups in these areas as the tree canopy increases, causing more severe fires and the accompanying loss of soil and fertility. Heavier fuel loadings in the grass/sagebrush areas would create similar conditions, increasing the loss of soil structure and increasing the potential for hydrophobicity and increased runoff.

Residual Impacts: No residual impacts are expected.

13. Wetlands and Riparian Zones:

A. Proposed Action- Prescribed fire within riparian areas would have utility. Many of the riparian areas in the Elko District do not have surface flow and are maintained by high soil moisture content. The areas with flowing surface water, that have no appropriate buffer strip, would be sensitive to the effects of short-term erosion, sedimentation, turbidity, and in-stream temperature increases Riparian areas are adapted to a natural fire regime. Prescribed fire would assist in keeping these areas from being encroached upon by sagebrush and other non-riparian vegetation. The plant species found within the riparian areas are all moderately to well adapted to fire. Optimal burning time would be when the duff and organic have a moisture content of 100 percent or more. This would limit loss of organic material, reduce soil heating and minimize damage to rhizomes and the basal buds of the vegetation.

Cumulative Impacts: Appropriate grazing management strategies combined with prescribed fire usage could lead to healthier and more diverse riparian areas.

Residual Impacts: No residual impacts are expected.

B. No Action Alternative - Continued fuel buildup in areas adjacent to riparian zones would increase the probability of severe fire burning into and through the riparian areas. Large fires normally occur during July and August when the soil moisture is the lowest in the riparian areas. The riparian areas would be most damaged by fire at this time of year.

Cumulative Impacts: The chances of a severe wildfire burning in July or August when riparian areas are at their driest would increase. Fires of this type could lead to longer vegetative recovery and increase erosion, channel down-cutting and stream sediment loading. This could negate any appropriate grazing management strategies that could improve riparian vegetation.

Residual Impacts: Residual impacts would be the same as cumulative impacts listed above.

14. Vegetation:

A. Proposed Action - In the short term, prescribed burning could decrease wildfire size and severity by removing ladder fuels and excess litter accumulation. Increasing the acreage of the targeted vegetation community types through prescribed fire would result in earlier vegetative successional stages which would alter succession. Prescribed fire may temporarily decrease total plant productivity on a site. The shift of species composition would be from dominance by woody species to dominance by herbaceous species. The shift in plant composition would be due to fire changing the numbers and species present on the site by altering the site conditions and reducing competition for moisture, nutrients, heat and light. In addition, seedbeds would be altered by reducing accumulations of litter and humus exposing bare soil for seedling establishment. There would be short-term reduction in productivity of many species but in the longer term, the target species would increase in productivity.

The proposed action would favor the woody shrub species in mountain brush communities such as serviceberry, snowberry and ribes species (*Ribes spp.*). These species would resprout and reestablish because burning would occur under more favorable conditions.

Prescribed fire would benefit sagebrush-dominated communities by reducing sagebrush density, canopy cover and competition between sagebrush and other herbaceous plant species for space, moisture and nutrients. Herbaceous species such as bluebunch wheatgrass, Great Basin wildrye, Bottlebrush squirreltail, Indian ricegrass, and Idaho fescue would increase in distribution, composition and production. In addition to the increase of grass species, the distribution, composition and production of forbs in the vegetative community would also increase.

In the woodland-type vegetative communities, encroachment by tree species such as juniper into other vegetative community types would be reduced. Subsequently, areas of decadent pinyon-juniper woodlands would be reduced, creating areas in which younger stands could occupy over time.

In areas where aspen species dominate, prescribed fire would allow for existing decadent stands which lack recruitment to reestablish themselves with younger, more vigorous stands. Prescribed fire would decrease encroachment of these areas by sagebrush and mixed conifers.

In the mixed-conifer vegetative community, reduced fuel loading and reduced fuel continuity would open up mineral soil for seedling establishment. Prescribed fire would also reduce the potential for large-stand replacement fires. It may also change the species composition, resulting in increased pine populations. Opening up the stands could increase forest health by reducing competition.

Under well-planned prescribed fires in which factors such as fire season of burn, fire severity, fuel loading, fuel moisture content, soil moisture content, and relative humidity are carefully monitored, this alternative can be a useful tool in reducing fuel loading while improving the overall health and productivity to targeted vegetative communities.

There is a potential for undesirable plant species such as cheatgrass (*Bromus tectorum*) to occupy a burned site. Cheatgrass is an exotic annual with little nutritive value for livestock and wildlife and creates a new, fire-prone environment. Prescribed fires must be carefully planned as to location, avoiding areas with high potential for cheatgrass conversion in order to minimize this impact.

Properly conducted prescribed burns could create a greater variety of successional stages in a variety of plant communities, beginning with the earlier successional grass and forb-dominated vegetation types and progressing to more shrub or tree-dominated vegetation types. These different successional stages provide for healthier vegetative communities which exhibit more diversity in plant distribution, composition and production.

Cumulative Impacts: The allotment evaluation process sets appropriate grazing management practices and provides for range improvement (vegetative and non-vegetative) projects. These, in conjunction with prescribed burning, would improve vegetative diversity in the herbaceous plants, improved age structure in the shrubs, and lead to greater vegetative production overall.

Residual Impacts: No residual impacts are expected.

B. No Action Alternative - Under this alternative, the likelihood of severe wildfire would increase over the long term. Vegetative management objectives would not be met in specific areas. As vegetative community types grow older and more decadent, age structure, productivity, species diversity, and species composition would be greatly reduced over time. In addition, the vegetative communities' susceptibility to disease and insect infestation could be increased as well.

Cumulative Impacts: The trend would be towards a more climax-dominated ecological condition which are not natural in disturbance-prone communities. The increased probability of severe wildfire could counteract the effects of appropriate grazing management systems.

Residual Impacts: Residual impacts would be the same as the cumulative impacts listed above.

***15. Noxious Weeds**:*

A. Proposed Action - Prescribed fire should be used sparingly in areas of high concentrations of noxious weeds to reduce the possibility of their invasion of burned areas. In areas of closed-canopy sagebrush, prescribed fire can be used to increase the density and cover of perennial grasses and forbs and to reduce bare ground that would serve as a target for invasion of noxious weeds. Prescribed fire can be seen as a preventative treatment for areas without large concentrations of noxious weeds. Long-term effects could include a reduction in the extent of spread of noxious weeds because the increase in herbaceous plant cover would decrease open niches available for weed establishment. Sites with a shrub mosaic or predominately herbaceous composition would have fewer open niches for weed invasion than closed stands of brush and trees with bare ground.

Cumulative Impacts: Implemented noxious weed control, appropriate grazing management, and prescribed fire can be used to improve the health of the vegetative communities. This could lessen the potential of weed colonization of native vegetation communities.

Residual Impacts: No residual impacts are expected.

B. No Action Alternative - Continued fuels build up could lead to severe fires that could lead to further spread of noxious weeds.

Cumulative Impacts: If weed control activities are not successful and if severe fires burn large acreages, the opportunities for weed colonization could increase.

Residual Impacts: Residual impacts would be the same as for cumulative impacts listed above.

16. Wild Horses:

A. Proposed Action - Conducting prescribed fire activities on the Elko District could negatively impact wild horses. During the time of the burn itself (if within an HMA), wild horses could be displaced and this could stress the animals. If post-fire grazing management includes fencing, horses may become trapped within the exclosure and close monitoring would be necessary to ensure that the horses were herded out of the exclosure. In the long term, prescribed fire would improve the range within the HMAs and increase forage for horses by increasing herbaceous forage. Prescribed fire in HMAs with heavy pinyon-juniper cover could create a mosaic pattern of cover for wild horses.

Cumulative Impacts: Implementation of Appropriate Management Levels (AML) of wild horses in conjunction with prescribed fire would improve habitat for horses, increasing forage availability, and increasing the mosaic of tree cover to provide better shelter and foaling areas.

Residual Impacts: No residual impacts are expected.

B. No Action Alternative - There would be no benefits of increased forage or mosaic of cover for wild horses resulting from prescribed fire. Continued fuels buildup could lead to a higher probability of large severe wildland fires that could severely impact the availability of forage and cover for wild horses and could cause large scale displacement of herds.

Cumulative Impacts:. Increased fuels buildup, coupled with decreasing vegetative diversity and large severe wildfires, could reduce wild horse habitat and could result in the removal of wild horses if the forage base was degraded.

Residual Impacts: Residual impacts are the same as the cumulative impacts listed above.

17. Livestock:

A. Proposed Action - In most instances, burned areas would not be available for grazing to allow vegetation to recover. The period of time in which burned areas would be rested from grazing is dependant upon severity of the burn and resource objectives in the area. This may cause a short- term economic impact to the allotment livestock permittee(s) due to temporary reduction of forage. Burned areas may be fenced to allow a burned area to recover.

The proposed total yearly prescribed fire acreage would be approximately 5000 acres. The maximum AUMs potentially impacted by prescribed fires in any one year is estimated to be 2,400 acres in the sagebrush/grasslands and seedings, and 240 in the tree areas. The actual burned grazing areas would likely be much less. This total is approximately 0.35 percent of the AUM's allocated on the Elko District. These AUMs would be placed in temporary suspension. Much of the loss of these AUM's could be mitigated by changing the season of use, temporary fencing and modifying grazing plans so the impact would be minimized.

In the long-term there is the potential for an increased forage base. It is anticipated that the proposed action would increase plant species diversity, plant composition, and forage production which would be available for livestock.

There is the potential to impact range management conditions in the long term should rehabilitation of burned areas not be successful. This potential should be greatly minimized if proper prescribed fire prescriptions are properly planned and implemented.

Cumulative Impacts: Appropriate grazing management strategies coupled with rangeland developments and prescribed fire could increase vegetative diversity and production leading to better future rangeland conditions and increased forage availability for livestock.

Residual Impacts: No residual impacts are expected.

B. No Action Alternative - In the short term, there will be fewer instances where livestock will be excluded from burned areas resulting in a less immediate economic impact to livestock permittees than under the proposed action. In the long-term there will likely be greater impact to range management conditions than under the proposed action. The long-term acreage burned as a result of wildfires has the potential to increase over time as unnatural fuel loading conditions worsen and fire intensity and severity escalate. As a result of escalation in wildfire and the risk of irreparable damage to vegetative communities, the potential for recovery of these areas could decrease due to increased wildland fire intensity and severity. Subsequently, this would result in a long-term increase in economic impacts to the livestock permittees in areas where these incidents occur. In addition, the potential for beneficial economic impacts resulting from use of prescribed fires, where appropriate management response is implemented, would not be realized. There is a long-term potential for the loss of perennial grass. Competition from sagebrush and other shrubs would out-compete the perennial grasses reducing their production per plant and reducing total numbers of grass plants.

Cumulative Impacts: The use of appropriate grazing management strategies to improve the condition of the vegetative community would be at least partially negated by the exclusion of fire. This could increase brush cover and reduce ecological niches available for herbaceous cover. Severe wildfires burning in the closed canopy sagebrush would reduce plant recovery rates as increasing fuel loadings would create hotter burning conditions increasing plant and soil damage.

Residual Impacts: Residual impacts would be the same as the cumulative impacts listed above.

18. Socio-Economic Conditions:

A. Proposed Action - The increased vegetative diversity resulting from prescribed burns could have a positive impact on big game and upland bird species, increasing the hunter days spent within the Elko District. Bird-watching and other dispersed recreational activities could increase as vegetative diversity would increase opportunities for non-game wildlife pursuits.

Cumulative Impacts: Hunting and recreational incomes may increase as the vegetative diversity would lead to an increase in big game, upland bird, and non-game habitat quality and quantity. This could increase the hunter and visitor days spent within the Elko District.

Residual Impacts: No residual impacts are expected.

B. No Action Alternative - In the short term, there would be fewer instances of wildlife disruption from burned areas, leading to better hunting and recreational opportunities. In the long term, there could be impacts to wildlife diversity as larger fires disrupt larger acreages of wildlife habitat and as diversity within the habitat decline. This could reduce hunting and other recreational opportunities. The potential for increased economic impacts resulting from the use of prescribed fire, where appropriate management response is implemented, would not be realized.

Cumulative Impacts: There is potential for long-term adverse cumulative impacts to the recreation economy if wildlife habitat continues to degrade as a result of fire suppression or severe wildfire. Past, present and future suppression efforts would lead to higher fuel loadings and more severe wildfires. Wildfire rehabilitation costs would increase as larger areas would require more monies to stabilize the watersheds damaged by severe wildfires.

Residual Impacts: Residual impacts would be the same as listed in the cumulative impacts listed above.

19. Monitoring:

Objectives - There would be two types of monitoring objectives for all prescribed burns: 1) pre-burn and post-burn monitoring to ascertain if the burn plan objectives were met and; 2) long-term monitoring to determine if resource management objectives were met. Monitoring would be used to affirm burn plan parameters or to modify future burn plans to better meet the resource objectives.

Type/Methodology - Each prescribed fire would have a monitoring plan in place as described in the burn plan. Monitoring would vary according to vegetation type and the goals and objectives of the individual burn. Monitoring for vegetative effects could include photo points and establishing line or point transects. Fuels management objectives in forest types would be monitored pre-burn and post-burn for fuel consumption by using photo series or fuels measurement transects. Air quality monitoring could include visual observation, photo documentation, and air monitoring using devices to record emissions on burns near a high concentration of sensitive receptors. Wildlife monitoring could consist of plots, transects, visual observation or population counts.

Priority - The immediate pre-burn and post-burn fire management monitoring would be a high priority to assure that the burn plan objectives were met. Other resource-specific monitoring would be prioritized according to District-wide priorities.

Frequency/Duration - Fire management monitoring frequency and duration would be for immediate pre-burn and post-burn and for a period of one year to assure that burn plan objectives for immediate fire effects were met. Other resource-specific monitoring for vegetation and wildlife response and would be based on established practices.

Reporting Procedures - Fire management data for the individual prescribed fire projects (acres, fuel type, fuel consumption, emissions) would be reported through the Department of the Interior Individual Fire Report (DI-1202). Resource-specific data would be included in reports on rangeland conditions.

V. Consultation and Coordination

A. List of Preparers:

Robert E. Means - Air Quality, Vegetation - Lead Preparer
Bob Miller - Environmental Coordination
Marlene Braun, Environmental Coordination
Tim Murphy - Archaeology, Native American Consultation, Paleontology
Evelyn Treiman - Recreation, Wilderness, Wild and Scenic Rivers, Visual Resources
Carol Evans - Riparian/Wetlands
Janice Stadelman - Lands
Skip Ritter - Forestry
Nancy Whicker - Water Resources
Carol Marchio - Soils, Air Quality
Mike Jensen - Vegetation, Socio-Economic Conditions/Livestock
Bruce Thompson - Vegetation
Kent Undlin - Wildlife, Threatened and Endangered Species
Stan Kemmerer - Noxious Weeds
Kathy McKinstry - Wild Horses and Burros

B. Persons, Groups and Agencies Contacted:

Elko Field Office Mailing List of Interested Public - 574 Names
Nevada State Clearing House
Northern Region, Nevada Division of Forestry
BLM, Salt Lake District

Responding Individuals and Organizations to Scoping Letter:

Don Henderson, Nevada Division of Agriculture
Jerry Hepworth, Rayrock Mines Inc.
Jim Andrae, IL Ranch
Rodd Hardy, BLM Salt Lake District
John Barber, Dee Gold Mining
Ray H. Williams Jr., Austin NV
John Dits, SWEATCO/ Rocky Mountain Elk Foundation
Rita Stitzel, Palisade Ranch
Preston Wright, Marys River Ranch
Jon Griggs, Maggie Creek Ranch
Peter M. Mori, Mori Ranch

Kenneth G. Jones, TI Ranches
Gary Zunino, Nevada Division of Forestry
Paul Bottari, Wells NV
Pete Talbott, 26 Ranch
Von L. Sorensen, Wells NV
John L. McLain, Resource Concepts Inc.
Kent McAdoo, JBR Environmental Consultants, Inc.
Joe Marvel, Elko NV
Terra Randolph, Nevada Division of State Lands
Nevada Commission for the Preservation of Wild Horses
George Lea, Public Lands Foundation
Vernon Dalton, Dalton Livestock
Jack M. Bowers, 7-H Ranch
Nevada Cattlemen's Association
Jerry Todd, Eureka NV
Carl Slagowski, Carlin NV
Randy Buffington, Eureka, NV
Jim Gallagher, Eureka, NV
Laurel Etchegaray, Eureka, NV
Ken Conley, Eureka, NV
John Balliette, Eureka County Natural Resources Department
Jim Baumann, Eureka, NV
Zane Miles, Eureka County Deputy District Attorney
Mike Griswald, Zeda Inc, Beowawe, NV
Tom Miller, George Gund Ranches
John Christensen, Carson City, NV
LeRoy Sestanovich, Carlin NV
Ken Barbenghorn, Paradise Valley NV
Doug Hunt, State of Nevada Division of Wildlife, Bureau of Habitat
Gordon Peake, Barrick Goldstrike Mining Co.
Paul A. Scheidig, Nevada Mining Association
Mike and Cheri Howell, Wells, NV
John Artz, Cool, CA
Craig C. Downer, Minden, NV
Colleen Cripps, State of Nevada Division of Environmental
Protection, Bureau of Air Quality
Heather Elliott, State of Nevada Clearinghouse
David R. Cowperthwaite, State of Nevada Department of
Environmental Quality, Clearinghouse Coordinator
Ray C. Bedke, Winecup Inc.
Carl Uhlig, Wells, NV
Dan Duce, PIC Technologies, Inc, Denver, CO

Martin R. Jones, Newmont Gold Company
James D. Morefield, State of Nevada Natural Heritage Program
Cal Lewis, C-L Ranch Salers

The following letters were received after the September 1, 1998 due date for comments. They were reviewed and comments were addressed where possible:

Nancy Brackett, Eureka, NV
Kirk Dahl, Ruby Valley, NV
Patsy and Tom Tomera, Carlin, NV
Pamela J. Marcum, Committee for Idaho's High Desert
Bob Schweigert, Intermountain Range Consultants
Rita Gustafson, Idaho Watersheds Project
Greg Beasley, Elko NV

C. Public Notice and Availability:

On District Planning Schedule for 1996 - 1998.

District Mailing List, letters sent on August 13, 1998 - response due date - 09/01/98.

News Release to Local Media Outlets sent out on August 17, 1998.

Topic discussed at regularly scheduled Native American consultation meeting by Tim Murphy on, August 18, 1998.

Environmental Analysis mailed to responding parties under 30 day comment period ending January 10, 2000.

Certified letters sent to the following Native American, Tribes, Bands and organizations on March 24 and 25, 1998:

Mr. Elwood Mose - Chair, Te-Moak Tribe of Western Shoshone
Ms. Nevada Pinoli - Chair, Wells Band, Te-Moak Tribe
Mr. Gelford Jim - Chair, Battle Mountain Band, Te-Moak Tribe
Mr. Wilbur Woods - Chair, Elko Band, Te-Moak Tribe
Mr. Marvin McDade - South Fork Band Council, Te-Moak Tribe
Mr. Larry Kibby - Western Shoshone Historic Preservation Society
Mr. James Paiva - Chair, Duck Valley Tribal Council

Mr. Arnold Appeney, Chair, Fort Hall Business Council
Ms. Diana Yupe - Heritage Tribal Office, Shoshone-Bannock Tribe

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Appendix A

Critical Elements to be Addressed in Elko District Prescribed Burn Plans

1. Description of the Burn Area:
    - A. Legal Description
    - B. Narrative Description of Area
    - C. Map (included in appendix)

2. Funding Source:
    - A. Funding code to be used
    - B. Total dollars allocated
    - C. Estimated cost for project

3. Identify the Resource Management Objectives:
    - A. Measurable resource objectives
    - B. Prescribed fire objectives

4. Range of Acceptable Results:
    - A. Quantifiable terms

5. Smoke Management:
    - A. State permit
    - B. Smoke sensitive areas
    - C. Visibility concerns and hazards
    - D. Wind direction
    - E. Mixing Height
    - F. Transport Winds
    - G. Smoke Modeling Information (if applicable)
    - H. Smoke Reduction and Mitigation Measures (if applicable)

6. Provisions for Public Safety:
    - A. Private property
    - B. Sensitive features (resource based)

7. Level of Complexity:
    A. As per NWCG complexity rating guide (form in appendix)
    B. Organization needed (complete form in appendix)

8. Communications:
    A. Radio frequencies
    B. Other communications

9. Fire Prescription:
    A. Flame lengths and Rates of Spread
    B. Fixed indicators
    C. Variable indicators
    D. Fuel model(s) used
    E. Prescription window
    F. Note on Behave limitations

10. Operational Details:
    A. Spot weather forecast
    B. Preparatory work needed
    C. Test fire plan
    D. Firing techniques and equipment
    E. Holding plan
    F. Mop up plan
    G. Patrol plan
    H. Medical Plan

11. Contingency Plan:
    A. If fire exceeds prescription parameters
    B. If fire exceeds line holding capabilities
    C. If fire exceeds allowable boundaries

12. Medical Plan

13. Risk Assessment:
    A. Estimate probabilities of success & failure and associated dollar costs
    B. Consequences of failure to life, property
    C. Smoke management concerns
    D. Local/regional/national fire situation
    E. Predicted fire weather, fire behavior, fuel conditions and drought impact.

14. Pre-burn Monitoring:
    A. Weather

B. Vegetation/fuels
C. Monitoring plots

15. Post-burn Evaluations:
A. Determine if project objectives met
B. Document burn day conditions
C. Document smoke dispersal
D. Document fire effects and results

16. Provisions for Pre-burn Coordination:
A. Public involvement
B. Public and agency notification

Appendices:

1. Job Hazard Analysis
2. Safety Plan
3. GO-NO-GO Checklist
4. Prescribed Burn Briefing Guide
5. Complexity Guide
6. Organizational Chart
7. Behave and RX Windows Runs
8. SASEM Smoke Modeling Runs
9. NEPA Documentation and Maps

Appendix B:

Threatened, Endangered, Candidate and Sensitive Species of Plants and Animals Likely to Occur or Documented on BLM - Elko Field Office Lands as of February 1999[1] .

COMMON NAME	SCIENTIFIC NAME
Federally Endangered Species	
none	none
Federally Threatened Species	
peregrine falcon	*Falco peregrinus anatum*
bald eagle	*Haliaeetus leucocephalus*
Lahontan cutthroat trout	*Oncorhynchus clarki henshawi*
Federal Candidate Species	
Columbia spotted frog	*Rana luteiventris*
State of Nevada Listed Species[2]	
Mammals	
spotted bat	*Euderma maculatum*
Birds	
goshawk	*Accipiter gentilis*
golden eagle	*Aquila chrysaetos*
burrowing owl	*Athene cunicularia*
ferruginous hawk	*Buteo regalis*
Swainson's hawk	*Buteo swainsoni*

osprey	*Pandion haliatus*
white pelican	*Pelecanus erythrorhynchos*
white-faced ibis	*Plegadis chihi*
Fish	
relict dace	*Relictus solitarius*

Nevada BLM Sensitive Species	
Mammals	
small-footed myotis	*Myotis ciliolabrum*
long-eared myotis	*Myotis evotis*
fringed myotis	*Myotis thysanodes*
long-legged myotis	*Myotis volans*
Yuma myotis	*Myotis yumanensis*
pale Townsend's big-eared bat	*Plecotis townsendii pallescens*
Pacific Townsend’s big-eared bat	*Plecotis townsendii townsendii*
Preble’s shrew	*Sorex preblei*
Birds	
western sage grouse	*Centrocercus urophasianus*
black tern	*Chlidonias niger*
mountain quail	*Oreortyx pictus*
Fish	
interior redband trout	*Onchorhyncus mykiss gibbsi*
Mussel	
California floater	*Anodonta californiensis*
Butterflies	
Mattoni’s blue butterfly	*Euphilotes rita mattoni*
Nevada viceroy	*Limenitus archippus lahontani*

Plants	
Bruneau River prickly phlox	*Leptodactylon glabrum*
meadow pussytoes	*Antennaria arcuata*
Elko rockcress	*Arabis falcifructa*
Goose Creek milkvetch	*Astragalus anserinus*
Barren Valley collomia	*Collomia renacta*
broad fleabane	*Erigeron latus*
Lewis buckwheat	*Eriogonum lewisii*
grimy ivesia	*Ivesia rhypara var. rhypara*
Grimes vetchling	*Lathyrus grimesii*
Packard stickleaf	*Mentzelia packardiae*
least phacelia; dwarf phacelia	*Phacelia minutissima*
Cottam cinquefoil	*Potentilla cottamii*

[1] Based on input provided by BLM, Nevada Division of Wildlife, and U.S. Fish and Wildlife Service in BLM Instruction Memorandum No. NV-98-013 (February 27, 1998). BLM Elko Field Office input provided for BLM Instruction Memorandum No. NV-98-013 was entitled “Former Candidate Category 2 Species On Or Suspected On Elko District -BLM Lands Recommended As BLM Sensitive Species As Of 5/96".

[2] Per wording for Table IIa. in BLM Instruction Memorandum No. NV-98-013 for Nevada State Protected Animals That Meet BLM’s 6840 Policy Definition: Species of animals occurring on BLM-managed lands in Nevada that are: (1) ‘protected” under authority of Nevada Administrative Codes 501.100 - 503.104; (2) also have been determined to meet BLM’s policy definition of “listing by a State in a category implying potential endangerment or extinction”; and (3) are not already included as BLM Special Status Species under federally listed, proposed, or candidate species. Nevada BLM policy is to provide these species with the same level of protection as is provided for candidate species in BLM Manual 6840.06C.

Appendix C:

Nevada Noxious Weed List

NEVADA NOXIOUS WEED LIST		
Common Name	***Latin Name***	**Other Name(s)**
Austrian fieldcress	*Rorippa austriaca*	Swaisonpea
Austrian peaweed	*Sphaerophysa salsula*	
Black henbane	*Hyoscyamus niger*	
Camelthorn	*Alhagi pseudalhagi*	*A. camelorum*
Canada thistle	*Cirsium arvense*	
Carolina Horsenettle	*Solanum carolinense*	
Common crupina	*Crupina vulgaris*	
Common St. Johnswort	*Hypercium perforatum*	Goatweed; Klamath weed
Dalmation toadflax	*Linaria genistifolia ssp. dalmatica*	
Diffuse knapweed	*Centaurea diffusa*	
Dyer's woad	*Isatis tinctoria*	
Hoary cress	*Cardaria draba*	whitetop
Houndstongue	*Cynoglossum officinale*	
Iberian starthistle	*Centaurea iberica*	
Johnsongrass	*Sorghum halepense*	Perennial sorghum
Leafy spurge	*Euphorbia esula*	
Mediterranean sage	*Salvia aethiopis*	
Medusahead	*Taeniatherum caput-medusae*	Medusahead rye

NEVADA NOXIOUS WEED LIST		
Common Name	***Latin Name***	**Other Name(s)**
Musk thistle	*Carduus nutans*	
Perennial pepperweed	*Lepidium latifolium*	Tall whitetop
Perennial sowthistle	*Sonchus arvensis*	
Poison Hemlock	*Conium maculatum*	
Puncturevine	*Tribulus terrestris*	
Purple loosestrife	*Lythrum salicaria*	Purple lythrum
Purple starthistle	*Centaurea calcitrapa*	
Rush skeletonweed	*Chondrilla juncea*	
Russian knapweed	*Centaurea repens*	
Saltcedar	*Tamarix ramosissima*	Tamarisk
Scotch thistle	*Onapordum acanthium*	
Silverleaf nightshade	*Solanum elaeagnifolium*	White horsenettle
Spotted knapweed	*Centaurea maculosa*	
Squarrose knapweed	*Centaurea virgata ssp. squarrosa*	
Sulfer cinquefoil	*Potentilla recta*	
Yellow starthistle	*Centaurea solstitialis*	
Yellow toadflax	*Linaria vulgaris*	butter and eggs
Waterhemlock	*Cicuta ssp.*	
Western waterhemlock	*Cicuta douglasii*	
Wild licorice	*Glycyrrhiza lepidota*	American licorice

Appendix D:

Native American Notification and/or Consultation Contacts
Elko District Prescribed Fire Plan

03-21-98 Certified letters to the following individual was delivered: Larry Kibby (Director of the Western Shoshone Historic Preservation Society).

03-23-98 Certified letters to the following individuals were delivered: Elwood Mose (Te-Moak Tribe), Nevada Penoli (Chairperson Wells Band), James Paiva (Chairperson Shoshone-Paiute Tribe) Arnold Appeney (Chairperson Shoshone-Bannock Tribe).

03-24-98 Certified letters to the following individuals are delivered: Wilbur Woods (Chairperson Elko Band), Marvin McDade (Chairperson Southfork Band).

03-28-98 Certified letter to the following individuals was delivered: Gelford Jim (Chairperson Battle Mountain Band)

05-5-98 The need to complete consultation for this project was mentioned a meeting with members of the Te-Moak and Yomba tribes. Among those present were Elwood Mose (Chairperson Te-Moak Tribe), Clarence Andreozzi (Council member Wells Band), Kevin Brady (Chairperson Yomba Tribe), Maurice Frank (Vice-chairperson Yomba Tribe), Bernice Lalo (Battle Mtn. Band) and Donna Comacho (Band Coordinator, Battle Mtn. Band).

05-20-98 Telephone conversation with Winona Charles (Cultural Resource Section). They will first respond to another two projects and then get to this one.

05-20-98Phone Call from Larry Kibby - Mr. Kibby said he would respond to the BLM letter regarding the project.

06-01-98 Telephone call to Wilbur Woods (Elko Band). Mr. Woods said he would provide a response.

06-01-98 Telephone call to Larry Kibby (Western Shoshone Historic Preservation Society). Mr. Kibby said he had been authorized to act on cultural resource matters for the Elko Band and would wait to respond until he has official notification.

06-01-98 Telephone call to Mavin McDade (South Fork Band). Mr. McDade said that the South Fork Band had no concerns with this project.

06-01-98 Messages were left asking Donna Comacho (Battle Mtn. Band), Ted Howard (Shoshone Paiute Tribe) and Nevada Penoli (Wells Band) to call BLM concerning the project.

06-02-98 Nevada Penoli (Wells Band) attempted to call Tim Murphy of BLM.

06-03-98 Message left for Elwood Mose to call BLM concerning the project.

06-03-98 Telephone call to Donna Comacho (Battle Mtn. Band). Ms. Comacho said she would get with Bernice Lalo who had the consultation letters from BLM. She said they would decide whether to comment or request a field trip.

06-03-98 Conference call with Ted Howard and Winona Charles. Mr. Howard indicated that they would respond to the project.

06-03-98 Message left for Nevada Penoli to call concerning the project.

06-03-98 Message left for Arnold Appeny (Shoshone-Bannock Tribe) to call concerning the project.

06-05-98 Telephone call from Nevada Penoli (Wells Band). Ms. Penoli said she did not like large fires but that she had no concern with the BLM's goal to use fire for managing vegetation.

06-11-98 Phone call from Larry Kibby. Mr. Kibby said he is now authorized to represent the Elko Band Council for cultural resource matters and will respond to the proposed Elko District prescribed fire plan.

06-11-98 Telephone call to Winona Charles (Shoshone-Paiute Tribe) asking the status of their comments. Ms. Charles has another letter to prepare before she can get to this one.

06-11-98 Phone call to Bernice Lalo (Battle Mtn. Band). Ms. Lalo has not had time to review the letters, but will respond by June 25. Friday, June12, 1998.

06-11-98 Faxed letter concerning the project received from Larry Kibby (representing the Western Shoshone Historic Preservation Society and the South Fork Band Council).

06-12-98 Message left for the new Chairperson of Shoshone-Bannock Tribe, Keith Tinno, to call the BLM in regard to the project.

06-12-98 Message left for Elwood Mose to call the BLM in regard to the project.

06-29-98 Phone call to Ted Howard. In regard to the prescribed fire plan Mr. Howard said that he would prefer to respond to individual burns rather than to the prescribed fire plan because the plan area is so big and the impacts so different. He said he would put this in writing.

08-18-98 Monthly meeting between the BLM and Te-Moak Tribe. Only two Shoshone were present and only the Wells Band was represented by a council member. Chairperson, Nevada Penoli again expressed concerns about large fires and prescribed fires escaping to burn larger areas. She was especially concerned about fires escaping to burn pinyon groves. However, burning in spots is okay.